



SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN

PHOENIX, ARIZONA MARCH 2013, VOLUME 67, NO. 1




1938 2014
DESERT
BOTANICAL
garden



The Garden's 75th Anniversary

A milestone so important, we are going to spend a year celebrating!

Today Gertrude's and Gustaf's dream has been more than realized. As we look to the next 75 years, our vision is to continue on a path that will be just as remarkable for its time.

On February 12, 1939, the passion and dedication of Gustaf Starck and the determination and drive of Gertrude Webster, Garden co-founders, culminated in the opening of the Desert Botanical Garden in Papago Park. This year we renew their commitment to the Garden as we celebrate our 75th anniversary. Beginning in January 2013, our anniversary year, we will host a myriad of events, exhibitions, and activities designed for all ages and all seasons.

Garden volunteer Ron Lieberman spent this past year digging through and studying archival materials in the Garden's Schilling Library to develop extensive biographies of both Starck and Webster. We believe you will find these biographies fascinating reading; they are available at the Schilling Library.

In this issue, we present "journals" from Starck and Webster. We have taken some literary license, but wanted to give you a sense of their adventures on our behalf. We hope this inspires you to share your own memories with us. Please send us your favorite Garden



memorabilia—old photos, post cards, or journal entries for our archives and website. See article page 19.

Also, in this *Sonoran Quarterly* we focus on two of the key mission areas of the Garden—conservation and research. The article by Dr. Kimberlie McCue is extremely compelling as she describes how the specimen plants that form the organ pipe forest on the *Sonoran Desert Nature Trail* were first salvaged, and why certain areas of the Garden were set aside for a future and extensive collection of agaves. You will also meet a sampling of past and present researchers and conservationists—

the "giants" of our staff—and learn about their impact on the Garden's legacy as their work of the past 75 years took us from good to great to world-class.

I hope that you have discovered Gertrude's restaurant by now, which opened in January in the former plant shop. It has been a long-term dream to have a fine restaurant on our grounds and we are delighted to have the owners of Fabulous Food Fine Catering and Events as the restaurant operator.

Today Gertrude's and Gustaf's dream has been more than realized. As we look to the next 75 years, our vision is to continue on a path that will be just as remarkable for its time—forward thinking, far-reaching, and equally compelling. We have much to celebrate and look forward to seeing you at the Garden many times during our 75th anniversary year.

Ken Schutz,
The Dr. William Huizingh
Executive Director

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The Sonoran Quarterly

Spring 2013/Volume 67, No. 1

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Desert Botanical Garden historical photos courtesy
of the Schilling Library Archives.

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Spring Plant Sale

Sponsored by *The Arizona Republic* and *Chipotle Mexican Grill*

March 15 - 17 / Event Plaza Parking Lot

Garden Members Preview:

Friday / March 15 / 7 a.m. - 5 p.m.

Open to the General Public:

Saturday / March 16 / 7 a.m. - 5 p.m.

AND Sunday / March 17 / 9 a.m. - 5 p.m.

Visit dbg.org/plantsale for more information.

Journals of Gustaf and Gertrude:

How it Might have Happened

Editor's Note:

The journal entries that follow represent how we imagine Gustaf Starck and Gertrude Webster came to meet, collaborate, and ultimately bring into being the Desert Botanical Garden. We are indebted to Garden volunteer Ron Lieberman, whose extensive research provided the factual basis for these fictitious journals. His original research is available at the Schilling Library. We are equally indebted to Valley writers Martha Hunter and Pam Hait for creating these journals, which so compellingly bring to life our founders, Gustaf and Gertrude.

GUSTAF STARCK'S JOURNAL ENTRIES

September 1919

Otilla and the children are pleased to be in Arizona, although she misses Wisconsin and its tall trees. We have hopes her health will improve. I am happy, as desert plants have been my passion since childhood when Father brought specimens home from his sea travels. No one in Sweden ever saw such plants.

Christmas 1919

Santa found us in the desert. Otilla gave me a botany book I have coveted. She seems a bit better. The Salt River Valley Water Users Association promises to be an excellent employer.

March 21, 1920

We celebrated the first of spring with a specimen-collecting field trip. The two girls enjoyed it. I brought home spiny desert cacti for our garden. Our son stayed home with Otilla who is feeling poorly.

June 29, 1920

The desert is truly filled with weird-looking plants, which produce flowers of a beauty impossible to describe. Like my plant collection, my library is also growing. I have more questions than answers about cacti.

September 1920

I have not been able to write - my grief is all encompassing. Otilla is gone. She returned from summering in Wisconsin and left us in August. I will make a garden in her memory.

October 1920

I purchased 9.6 acres in the tiny town called Scottsdale. The property has a small citrus grove and is on the main road, if one can call it that. If only Otilla could have lived to see this.

January 1925

Nettie and I rang in the New Year with the children, who have welcomed their new mother. My little ranch is now a destination for those who love the desert. I dislike boasters but admit I'm now a well-known resource for desert plants. At Nettie's suggestion I made and posted signs: "Save the desert" to guide people to my garden.



**GERTRUDE
WEBSTER'S
JOURNAL
ENTRIES**



January 1925

Hugh and I are here in Arizona for the winter and my daughter, Diana, seems better. Tuberculosis is a dreadful disease. I won't miss the Vermont weather but I pine for my estate in Manchester. So little in Phoenix is green. I am hopeful the social scene is not a desert.

April 1926

I purchased 10 acres on the south slope of Camelback Mountain. Small lot but adequate for our family and staff. I'm amazed that I have fallen in love with this landscape. The sunsets are brilliant and the climate is a gift for Diana. I've had inquiries about this area and see opportunity to trade in land.

February 1928

I have done it. I filed for divorce from Hugh Webster. Cupid has not been kind to me. My marriage to Hugh lasted just four years. My first marriage to William Ritter lasted barely a dozen years but then we spent another twelve years finalizing the divorce settlement. In the end, Mr. Ritter was generous...several million dollars, the house on embassy row, and the 400-acre estate in Manchester. And my annual sum of \$70,000 a year to maintain my lifestyle.

September 1930

Returned from Europe with extraordinary, rare plants. I am to meet with a gentleman named Gustaf Starck next week. He's the local botanic expert.



*I have fallen in love
with this landscape. The
sunsets are brilliant and the
climate is a gift for Diana.
— Gertrude*

GUSTAF:

September 1930

I met Gertrude Webster today. A most formidable woman. She could be the champion for the public garden I want to create here. My newspaper articles have piqued some interest in preserving and celebrating the desert, but the public is fixated on what they left behind in the East and Midwest. They don't value the desert. Gertrude does. She bought 500 acres this year! She has determination and the means. I will keep in contact with her.

October 1931

I have the ideal location for my garden! Papago Park is no longer a national monument so a portion of it could be transformed into a botanical garden of the desert. I'm going to contact Gertrude.





GERTRUDE:

May 1932

I told my cook we have no more parties scheduled and she was relieved. One wouldn't know there is a Depression by the number of social engagements we've had this season. Thank heavens I still have a large supply of liquor, part of my divorce settlement from Mr. Ritter. Will prohibition never end? We leave for Manchester soon and Gustaf will watch over my botanic collection. He is a dear.

December 1932

Gustaf is determined to get me involved in his scheme to create a garden for Phoenix.

January 1933

I attended Gustaf's study group. We discussed the desert and the importance of preserving it. I left early as I had to meet with a prospective buyer for 40 acres out of one of my 160-acre parcels. Fortunately we have quite a lot of desert.

March 1934

I joined the new society Gustaf organized - the Arizona Cactus and Native Flora Society. He is passionate but doesn't have the necessary contacts or influence so I promised to assist him. We need to recruit the right sort of people if we are to succeed.

Gertrude hosted a lovely evening for 50 guests. Like cacti, our group is slow-growing but we are making progress.

— Gustaf

GUSTAF:

April 18, 1934

Success! We held our first meeting! 16 members. Nettie told me how proud she is of me. Gertrude was very supportive.

October 1934

Gertrude remains very enthusiastic. Nevertheless the Society struggles and my garden is no closer to reality.

January 1935

Gertrude hosted a lovely evening for 50 guests. Like cacti, our group is slow-growing but we are making progress.

May 1935

I spoke this afternoon in front of the Phoenix Chamber of Commerce. They endorsed our garden for Papago Park. A milestone.





Gustaf nominated me for president of the Arizona Cactus and Native Flora Society. I am enormously flattered and quite anxious to begin.

— Gertrude

GERTRUDE:

September 1936

Gustaf nominated me for president of the Arizona Cactus and Native Flora Society. I am enormously flattered and quite anxious to begin.

October 1936

I have met with the owners of *The Arizona Republic* and KOY and scheduled a meeting with Harry M. Fennemore, the prominent attorney. I will contact Charles Gibbs Adams, the landscape architect for Cecil B. DeMille, and ask him to draw up preliminary plans for (my) our public garden.

November 1936

My slogan, "Not to destroy but to glorify" was unanimously adopted!

GUSTAF:

September 1936

Clearly Gertrude is the correct choice for president. Thanks to her enthusiasm and her unselfish devotion and her unusually skillful administration, the Society is becoming a prominent factor in the life of Phoenix.

October 1936

Gertrude is a marvel, although I would have liked to be involved in her meetings.

November 1936

Can I confess that I have sympathy for Mr. Ritter? Gertrude has such a domineering style; she leaves no air in the room for anyone else. I take solace in my garden which is now more than 600 specimens.

December 1936

Another party at Gertrude's with luminaries of Phoenix. Gertrude loves her gin and shocked some guests when, after dinner, she lit up her favorite *Between the Acts* cigar. Her cigar, along with her musk perfume, impelled some of us to retreat to the patio despite the winter chill.

March 1937

Testified today in front of the legislature for the garden in Papago Park. Being a conservative group, they objected to the annual maintenance fee we proposed.



GERTRUDE:

April 1937

What a ridiculous decision. The Arizona legislature rejected our petition to establish the Garden in Papago Park. They refused our request of \$2,500 a year to maintain the Garden. A pittance.

July 1937

Vermont is lovely but no rest for poor me. I have sent instructions for the layout for the Garden and continue raising funds. My goal is \$40,000. I instructed my broker to send a check for \$10,000 to the Society. We must demonstrate to all that Arizona has failed to recognize - a great natural legacy.



GUSTAF:

March 1938

Back again at the State legislature. This time we asked only for land. They were receptive.

July 1, 1938

We have our permit! Now have only six months to create our Garden or we lose the rights to our land. Gertrude will donate hundreds of plants and the services of her gardener; I will donate my collection of all 700 plants. I've contacted Phelps Dodge to salvage the organ pipe and barrel cacti from the Ajo mining site. A group of us are going to Congress Junction to collect Joshua trees for the Garden.



GERTRUDE:

July 1, 1938

Uncork the champagne! We have our permit to build our Garden.

December 12, 1938

The first cacti arrived!! We are on our way.

February 12, 1939

"Our purpose is three-fold. We wish to conserve our Arizona desert flora, fast being destroyed. We wish to establish scientific plantings for students and botanists. We wish to make a compelling attraction for our winter visitors."

Note: we had a marvelous photograph in The Arizona Republic. I was praised.

GUSTAF:

February 12, 1939

The culmination of my dream. We have a Garden! Nettie was incensed as I was not properly acknowledged and have been pushed to the sidelines. But there would be no Garden without Gertrude's drive, determination, influence, and wealth. After the dedication Nettie and I went home and drank a toast to Gertrude, the Garden, and Mr. Ritter.

For more history, see "Gustaf Starck, Founder of the Arizona Cactus and Native Flora Society" and "Gertrude Divine Webster and The Desert Botanical Garden," both available at the Garden's Schilling Library.

ANNIVERSARY CELEBRATION



HIGHLIGHTS

Dinner on the Desert 2013: A Garden for All Seasons

April 27, 2013: Dinner on the Desert will honor the Garden's timeless, treasured beauty and celebrate our 75th anniversary year. For information and reservations, contact Esther Battock, ebattock@dbg.org, 480 481.8182.

Community Celebration

Saturday, September 28, 2013:

Free Day. More information will be available in summer 2013 at dbg.org.

Desert Council Celebration

Sunday, September 29, 2013:

Free Day for employees of Desert Council Members at the Palo Brea and Palo Verde levels. Desert Council is an association of generous companies and organizations who support the Garden. For more information, contact Julie Wagoner, jwagoner@dbg.org, 480 481.8115.

Special Exhibition Events

November 8, 2013: Opening gala. Ticket proceeds to support the Heritage Garden and other 2012-17 initiatives. For more information, contact Marcos Voss, mvoss@dbg.org, 480 481.8179.

November 9, 2013: Complimentary opening preview for Garden Fund and Patrons Circle Donors. For more information, contact Lauren Svorinic, lsvorinic@dbg.org, 480 481.8147.

75th Anniversary Luncheon

February 2014 (date TBA):

Garden Party with ticket proceeds benefitting the Garden's 2012-17 Initiatives and featuring two debuts: An update and republication of *Oasis in the City*, *The History of the Desert Botanical Garden* and Honor Installations to enhance the Garden's named spaces and recognize our most generous philanthropists.

Thank you to our 75th Anniversary Chairs

Confirmed as of 2/12/2013

Oonagh Boppart & Hazel Hare
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Lee & Mike Cohn

Opening Gala Co-Chairs
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Anniversary Cabinet Chair

William Huizingh, Ph.D.
History Book Chair

Jan & Tom Lewis
Dinner on the Desert 2013 Co-Chairs
Barb Lieberman

Anniversary Tour Chair
Marta Morando

Donor Recognition Committee Chair
Carolyn O'Malley

*Anniversary Recognition
Installations Chair*

Bruce Weber
Marketing Committee Chair

Research and Conservation VISION *for* GENERATIONS

by Dr. Kimberlie McCue, Program Director, Conservation of Threatened Species and Habitats

Imagine being entrusted with a dream. A dream that began before you were born, that has grown and been shepherded by previous generations, and that you must one day hand off to the future in even finer condition than the one in which you received it. This is the amazing reality that the staff and volunteers of the Garden work within every day.



Pediocactus sileri.
Photo by Daniela Roth.

As we embark on our 75th anniversary celebration year, we thought it fitting to look back at the dream that started it all and see how, with each generation, the dream-keepers have worked to take the Garden from good to great to world-class. I have the pleasure of sharing here a little information about two key elements of our founders' dream—research and conservation of the desert and its flora—how it began, what we have accomplished, and what we are putting in place for the future.

Dedication and Vision from the Start

George Lindsay, our first Director, wrote and submitted the Garden's first annual report in April 1940. In it he outlines the genesis of the Garden, which evolved from the Arizona Cactus and Native Flora Society's goal of "preservation of the native flora of Arizona." This idea developed in the 1930s, a time when conservation was not a part of the everyday lexicon. Even more striking is the revelation that, by the time the Garden opened, the vision was of a place "where rare and nearly extinct species might be preserved and propagated."

No time was wasted in pursuit of the Garden's conservation goals. In short order, hundreds of organ pipe (*Stenocereus thurberi*) cuttings that were "being covered by the mine dumps at Ajo" had been salvaged and brought to the Garden. Many of these cuttings have grown into beautiful specimen plants that form an organ pipe forest along the *Sonoran Desert Nature Trail* (see *Sonoran Quarterly*–September 2010, Volume 64, No.3). A collection of the rare *Utahia sileri* (now known as *Pediocactus sileri*; Siler's pincushion cactus) was made from northern Arizona, during which time Lindsay documented that the greatest distribution of this species is in Arizona, not its namesake Utah. (*P. sileri* is now a federally listed threatened species).



George Lindsay,
the Garden's first Director



Just a few of the specimens in the Garden's National Collection of Agavaceae. Photo by Adam Rodriguez.

Research on desert flora was also on the minds of the Garden's founders. For example, as *Agave* was soon identified as one of the least known groups of plants, a plan to expand scientific knowledge of the group was laid out in year one. Among the many professionals who helped guide the development of the Garden was Mr. William Hertrio of Huntington Botanical Gardens, who suggested that certain areas of the Garden be set aside for an extensive collection of agaves, "so that notes and herbarium specimens can be made when the various ones bloom, photographic records made, etc., with the idea of working out and publishing a monograph on them perhaps twenty years from now."

We can only imagine the pride our founders would feel in knowing that the North American Plant Collections Consortium designated the Garden's collection of Agavaceae as the National Collection of that family in 2010. And though it took more than twenty years, the work is now considered as the "indispensable guide to agaves," *Agaves of Continental North America*, was published in 1982 by Garden researcher Howard Scott Gentry.

Lindsay's 1940 annual report ends with his recommendations on necessary infrastructure to support a truly viable research program. These included space for an herbarium...microscopes... a laboratory, and "library facilities." As you read on, you will learn how the Garden has met and in many ways exceeded Lindsay's vision for an outstanding research facility.

On the Shoulders of Giants

The success of an institution like the Desert Botanical Garden is always the result of the hard work and dedication of teams of people working toward common goals. However, there are also those individuals who stand out in providing the vision, expertise, and inspiration that takes the entire operation to a whole new level. In the history of the Garden's research and conservation endeavors, we have been fortunate to have many of these "giants" on staff, each of whom have made invaluable contributions that have elevated the stature of the Garden and given those who followed a clear view into the future.

An indication of how many invaluable researchers and conservationists we have had within the Garden family is that it would be impossible to tell all their stories in this single article. Consequently, I have chosen five to represent the tremendous legacy of the Garden's seventy-five year history.

Dr. Howard Scott Gentry was already a highly respected botanist when he joined the research department in 1971, having garnered many awards and accolades for his work in researching economically important plants, particularly those with medicinal uses. His position with the Garden was initially supported by a National Science Foundation grant to study agaves, which culminated with the publication of his masterwork on those plants. It was also through Gentry's work of collecting agaves in Arizona, Mexico, and Central America that the Garden's agave collection became one of the most complete in the world.

Dr. Gary Nabhan joined the Garden team in 1986, one year before Gentry retired. He took on the role of Director of Research and in his six years on staff created a dynamic, integrated research team. Strong emphasis was given to research on rare, threatened, and endangered plants,

Dr. Gary Nabhan,
Director of Research (1987 - 1992)

supporting the mission of the nascent Center for Plant Conservation (CPC), of which the Garden is a founding member. Today, the Garden continues as an active member of CPC with a program that curates fifty-two rare Southwestern species as part of the National Collection of Endangered Plants. Nabhan also coordinated collaborations with Mexican researchers to study the ecology and conservation of borderland plants. During Nabhan's tenure, the research staff was publishing an average of twenty papers per year. It was also during this time that Nabhan himself was awarded the MacArthur Fellowship (aka "genius award") and the Garden received an award for "excellence in a research program" from the American Association of Museums.

Dr. Edward ("Ted") Anderson came to the Garden in 1992 as Senior Research Botanist, with expertise in rare cacti and their conservation. Anderson expanded both the Garden's living and herbarium cactus collections. In 2001 his monumental and long-awaited work, *The Cactus Family*, was published.

This book is considered the "most comprehensive single resource on the subject available today."

Dr. Edward Anderson,
Senior Research Botanist



Wendy Hodgson,
Curator of the Herbarium and Research Botanist

Wendy Hodgson currently holds the positions of Curator of the Herbarium and Research Botanist. Hodgson began her career with the Garden in 1974 as a plant illustrator, becoming assistant curator in 1980 and curator in 1984. Under her watch, the Garden's herbarium collection has grown from 20,000 specimens to more than 70,000. Nearly 30,000 of these collections were made by Hodgson herself. She is a pioneer in setting the standard for the highest quality herbarium specimens, including attaching color photos of the plants and their



Grand Canyon Agave, *Agave phillipsiana*. Discovered and described by Hodgson. Photo by Adam Rodriguez.



Example of a Hodgson herbarium sheet. Photo by Matt King.

habitats to specimen sheets and including data on habitat and associated plant species on the labels. Hodgson's award winning book, *Food Plants of the Sonoran Desert*, was published in 2001. She has discovered and authored or co-authored descriptions of several species of *Agave* new to science. And, with over twenty years of exploration experience, she is also arguably the world expert on the flora of the Grand Canyon.



Dr. Joseph McAuliffe,
Director of Research, Conservation
and Collections (1992 to present)

Dr. Joseph McAuliffe came to the Research Department in 1990, bringing expertise in ecological research. When Gary Nabhan left the Garden in 1992, McAuliffe stepped into the role of Director of Research. In addition to his wide-ranging and highly regarded research in multiple aspects of desert ecology, McAuliffe has provided the vision for expanding the research department and its facilities in order to have an even greater impact and influence in the 21st century. Under his watch, multiple new positions have been created and staffed including Program Director, Conservation of Threatened Species and Habitats, Conservation Biologist (focused on conservation genetics), Conservation Collections Manager (overseeing care and expansion of the Garden's rare, threatened, and endangered plant collections), and Plant Physiologist.

McAuliffe also conceived of a "Conservation Think Tank" that would bring together diverse stakeholders to identify priority conservation issues and devise creative strategies to address them. This idea is coming to fruition with the creation of the *Conservation Alliance*, a winner of the inaugural Five Communities project sponsored by the Center for the Future of



Wolfberry clone - first reported by Dr. McAuliffe. Photo by Joe McAuliffe.

Arizona, which will foster community engagement to study, restore, and promote the desert mountain park preserves of metro Phoenix, with funding provided for the next three years by the Nina Mason Pulliam Charitable Trust. Also of significance is McAuliffe's successful bid to expand the name of the Research department to Research, Conservation and Collections (RCC), more fully reflecting the breadth and depth of its work.

Where it All Happens

Ask any of the Research, Conservation and Collections staff where they most like to work and they will invariably say "the field!" But, as George Lindsay made clear in 1940, to do great research you also need great facilities. In 2001, the research staff moved into the 13,700 sq. ft. Nina Mason Pulliam Desert Research and Horticulture Center. Here we have office and lab space; the herbarium and library are also housed in this facility. Not only do we have microscopes, we have computers, GPS (geographic positioning system) units, PCR (Polymerase Chain Reaction) machines for genetic studies, and much more. Because our programs and staff have continued to expand in number and scope, a new 1,200 sq. ft. expansion was completed earlier this year. The expansion provides additional office space for staff, students, and visiting scientists, as well as new molecular lab facilities. We trust that Lindsay would be pleased.

Indispensable to Our Team

There have been Garden members since the very first year the Garden opened. The hardships of World War II reduced the number of members to just nineteen, but from there the numbers have grown so that today member households number more than 29,000! We could not carry out the Garden's conservation and research missions without the support of you, our members. I hope you will take pride in being part of the Garden's legacy and in helping us as we strive to burnish the dream of our founders to pass on a world-class research and conservation garden to the future.

75
YEARS
and growing

DID YOU KNOW

The Arizona Cactus and Native Flora Society's first slogan was, "Not to destroy but to glorify."

DISTINGUISHED ELDERS:

10 of the Garden's Oldest Plants

By Beth Brand, Librarian and Raul Puente,
Curator of Living Collections

It's incredible. Cacti and succulents planted in the Garden nearly 75 years ago are still alive today. Planted in 1939, they have not only survived but are now some of the most magnificent specimens in the collection.

With no big box stores or nurseries in Phoenix selling quantities of cacti, specimens planted during the Garden's first year came from a variety of sources. Hundreds of plants came from the personal collections of Garden founders Gustaf Starck and Gertrude Webster. Even more plants were added by the Garden's first Director, George Lindsay, who in August 1939 collected a variety of species from the Baja Peninsula. Numerous cacti also came by way of Lindsay's friends, well known California nurserymen Howard Gates and Gilbert Tegelberg. Another important source of plant material came from salvaging cacti that would have otherwise been destroyed at mining sites throughout Arizona.

Starting with the very first cactus planted near Webster Auditorium, plants added to the collection were meticulously recorded in a leather bound accession book. Each entry includes the name of the donor or collector and the date and location of collection. The accession number included in the plant descriptions to follow is typed on a metal tag and placed next to each specimen in the beds. These initial records formed the foundation of the plant collections database we use today—livingcollections.org.

North of Webster Auditorium you can still see many of the surviving specimens planted in 1939. Here is a selection of 10 of these amazing plants and an account of their origin.



1. CREEPING DEVIL

(*Stenocereus eruca*): 1939-0001-01-1. This long, prickly, snake-like cactus was the very first to be accessioned into the collection. Donated by Gilbert Tegelberg from California and collected in Magdalena Island, Baja California Sur. Old photos show it planted several feet south of the large cardon. Today you will see the tips of this cactus right along the path on the north side of Webster Auditorium. It has grown 45 feet northeast from the original planting site!

2. DAGGER CLUB CHOLLA

(*Grusonia invicta*): 1939-0033 01-1. This is the surviving one of two plants donated by Gilbert Tegelberg from collections in Baja California. This low-growing cluster is 3.5 feet wide and is located at the edge of the path near the west end of Webster Auditorium. Armed with formidable central spines that are flat, stiff and extremely sharp, this tough plant grows very well in Phoenix's full sun.

3. CARDON

(*Pachycereus pringlei*): 1939-0084-01-9. Cardones are among the grandest, most photographed plants in the Garden. This cardon was one of 10 plants about 4 feet tall, collected by George Lindsay in San Fernando, Baja California. Six of the original cardon plants survive to this day; this one being the tallest at 35 feet.

4. SLIPPER PLANT

(*Pedilanthus macrocarpus*): 1939-0039-01-6. As you cross the bridge near the *Center for Desert Living Trail*, you will see this plant's pencil-like branches reaching through the railing. Collected between El Arco and Laguna de Chapala on the Baja Peninsula, Lindsay planted seven of these, four of which have survived and grown to 4 feet tall and 6 feet in diameter.

5. ELEPHANT TREE

(*Pachycormus discolor*): 1939-0075-01-1. A member of the cashew family (Anacardiaceae) and endemic to the Baja Peninsula, Lindsay found this specimen 10 miles south of Punta Prieta. Initially measured at five feet tall, this elephant tree has reached 20 feet to date. You will see it next to Webster Auditorium on the far west end.

6. BOOJUM

(*Fouquieria columnaris*): 1939-0072-01-1. Boojum trees are among the most unique looking and popular plants in the collection and this is one of the first to be planted in the Garden. Of the six plants Lindsay collected 10 miles west of San Fernando, Baja California, two have survived and grown to 15 and 26 feet respectively.

7. ORGAN PIPE CACTUS

(*Stenocereus thurberi*): 1939-0076-01-1. Standing in the shadow of a giant cardon, this plant originally consisted of a single branch with a crested apex. Nearly 75 years later, it has more than 50 branches and is 12 feet tall. Lindsay collected this plant five miles north of Mesquital Ranch, near El Arco, in Baja California.

8. NIGHT BLOOMING CEREUS

(*Acanthocereus tetragonus*): 1939-0362-01-2. This semitropical cactus came to us from

the private collection of Garden founder Gertrude Webster. This is one of the few semitropical cacti that can thrive in the Phoenix area, although under full shade of trees and with additional irrigation. A night bloomer, it produces large white flowers that attract moths for pollination. Several plants can be seen on Elliot Patio intertwined in the branches of a large *Bursera microphylla*.

9. MEXICAN FENCE POST

(*Stenocereus marginatus*): 1939-0240-01-6. In 1939, the Garden received 12 stem sections of the Mexican fence post from Mrs. Webster's estate. Eight plants are currently alive. Most can be seen around Webster Auditorium in the Baja Bed.

10. PITAYO

(*Stenocereus pruinosus*): 1939-0336-01-1. This plant came from the collection of Gustaf Starck, founder of the Arizona Cactus and Native Flora Society and the Desert Botanical Garden. Starck donated numerous plants to the Garden, 213 of which were accessioned. At only 5 feet tall, this plant is showing signs of age, as many arms have been lost due to age, frost and sun scorch. You can see this plant next to the stone bench north of Webster Auditorium.

From the beginning, odds were against those first vulnerable plants' survival, yet the founders were undaunted. Their belief that the Garden would one day be a thriving, beautiful place is a testament to their faith and foresight; now, nearly 75 years later, the beauty of the Garden is here for us to enjoy.

As part of our collections plan we have been propagating and planting propagules of the original specimens in various locations within the Garden. It is the Garden's commitment to perpetuate the legacy of its historical collection for future generations.

Many of the species featured here would make striking additions to your desert garden and are regularly available at the Garden's spring and fall plant sales.





4.



5.



6.



8.



9.



10.



A REMEMBRANCE *of the* DESERT BOTANICAL GARDEN



by Rev. Talitha Arnold,
Senior Minister
The United Church
of Santa Fe
Santa Fe, NM

The Desert Botanical Garden was a part of my family's life from the Garden's beginning. My grandmother, Talitha Barth Standing, and mother, Elizabeth Standing Arnold, attended the opening of the Garden in 1939, when my mother was a graduate student in desert botany. In the 1950s and '60s the Garden was often the place my family went on school holidays or after church. *(One of my favorite pictures is an old black and white photo of my older sister and me in our poodle skirts, dangling our feet on one of the stone benches.)* I don't have one specific memory of the Garden, but simply the overall remembrance of a magical and sacred place. It was a place to explore and learn new things as I tried to wrap my tongue around scientific names like *Carnegiea gigantea* or remember the difference between teddy bear and jumping cholla. The Garden instilled a sense of wonder with its incredible diversity of cacti and other plants. Thanks to the Garden, I learned that the desert is a place of life, not the barren wasteland so often portrayed in my school books.



Although I haven't lived in Arizona since high school, the Garden continues to be a wondrous and sacred place for me. It was always on the list of places to go when I visited my mother. Since her death twelve years ago, the Garden is where I go to remember. As I walk the Garden grounds, I remember not only my family, but also what the desert smells like after a rain and its abundance of life in this sacred corner of creation called the Sonoran Desert.



Send us your GARDEN MEMORIES

In celebration of the Garden's 75th anniversary, we invite you to send us your favorite Garden memories. Your memories can be submitted as the written word, images, or both. We hope that you will dig deep, remember those moments, find those old pictures, and allow us to gather them together in one place.

We plan to use your memories in Garden print publications, on our Website, in our social media, and in other outlets. After the year is over, we will archive the memories in the Schilling Library for future generations. To submit your memory, please email them to memories@dbg.org (images should be 2-4 MBs), or mail them to Garden Memories, c/o Desert Botanical Garden, 1201 N. Galvin Parkway, Phoenix, AZ 85008.

Please note: Submitted Garden memories, whether written words or image, become the property of the Desert Botanical Garden. The Garden reserves the right to use or not use the submitted memories or edit them for clarity. The right to use the Garden memories is not limited to activities surrounding the 75th Anniversary Celebration.



Gertrude's Now Open!

Our much anticipated restaurant, Gertrude's, opened in January 2013. Gertrude's is affectionately named after one of our founders, Gertrude Divine Webster.

Located in the former plant shop, the new space seats 80 people indoors, including bar seating and a chef's table, and 93 patrons on the outdoor patio. Designed by John Douglas of John Douglas Architects and built by Kitchell Perez, the restaurant features a continental breakfast, lunch, and dinner. It is open daily at 8 a.m., with the last dinner seating at 9 p.m. For lunch and dinner reservations please call 480 719.8600 or go to dbg.org/gertrudes to book online.

Skip and Chantal Hause, owners of Fabulous Food Fine Catering and Events, and now Gertrude's restaurant operator, have selected Stephen Eldridge as the executive chef. Well-versed in global cuisines such as French, Spanish, Italian, and Latin, Chef Eldridge has also worked locally at the Green House, Verona Chophouse, and Quiescence at the Farm at South Mountain.

The food experience at Gertrude's focuses on fresh, local cuisine so the menu changes often, based on the availability of local products. Appetizers, happy hour items, pasta, steaks, and lighter fare will be featured for dinner, as well as a full-bar menu that includes micro brews on tap, local Arizona and regional wine, and Garden-inspired cocktails made with native Arizona ingredients. Breakfast features fresh house made pastries, yogurt and fresh fruit. Lunch consists of lighter salads, vegetarian dishes, child-friendly cuisine, and grill items. The Garden will honor Gertrude Webster by continuing to promote the Sonoran Desert through interesting and unique food offerings.



garden news

Community Recognition for the Garden

The Desert Botanical Garden is honored to have received recognition through two recent award programs.

On October 31, 2012 the Garden received two awards through Valley Metro's Clean Air Campaign in the category of companies with 50-149 employees. This was Valley Metro's 25th year of recognizing businesses for their role in promoting alternative travel options and helping to improve air quality.

The Garden was recognized for having the "Outstanding Trip Reduction Program" for offering incentives to encourage people to use alternative forms of commuting to work. We also received the "Corporate Sustainability" award for the *Center for Desert Living Trail*, which demonstrates to our visitors how they can grow their own food, garden, create outdoor living spaces, and use resources responsibly.



Rich Boals (L) from Blue Cross Blue Shield of Arizona cuts the ribbon to open the new Edible Garden on the renovated *Center for Desert Living Trail*.



The Garden was named a finalist at the *Phoenix Business Journal's* 10th annual "Best Places to Work" award luncheon on December 6. These awards recognize businesses of all sizes for their efforts to create an engaged and supportive work force, based on feedback provided through surveys completed by employees. Our employees nominated the Garden for many reasons, including offering a beautiful work environment; having a strong commitment to our mission; promoting diversity, tolerance, appreciation and philanthropy; offering employee discounts; hosting onsite yoga classes; and supporting our employees' practice of conservation and sustainability.

U.S. Bureau of Reclamation Grant Awarded

Garden researchers Kevin Hultine, Shannon Fehlberg, and Andrew Salywon received a two-year, \$149,000 grant from the Bureau of Reclamation, Desert Landscape Conservation Cooperative program to study the combined impacts of climate change and biocontrol on a nonnative tree/shrub, *Tamarix*, in the southwestern United States. *Tamarix* was introduced to North America from Eurasia in the mid 1800s and has since spread along the banks of rivers, springs, and wetlands throughout the western United States. Its spread has caused many long-term changes to native riparian plant communities, leading to intensive efforts to remove *Tamarix* throughout the region. Among the most effective management approaches is the release of a biocontrol agent (the *Tamarix* leaf beetle) that feeds exclusively on the leaves of *Tamarix* and eventually kills many plants.

The project will focus on three major areas of research: 1) Determine if climate warming will enhance the beetle's impact on *Tamarix*, 2) determine if some *Tamarix* populations are more susceptible to the beetle's impact than others, and 3) evaluate how genetic change in the *Tamarix* leaf beetle will enable colonization throughout Arizona and northern Mexico. Researchers from Northern Arizona University, UC Santa Barbara, and the Colorado Department of Agriculture will collaborate.



Philip Haas

On November 15, the Garden hosted a reception to celebrate the opening of Philip Haas: The Four Seasons. Earlier that day, 80 students from Yavapai Elementary School visited the Garden on a complimentary field trip, where they experienced the exhibit with special guest Philip Haas as the tour guide. Act One Foundation generously sponsored the field trip as well as pre-visit activities, student travel costs, and post-visit activities. The Foundation is also sponsoring *The Four Seasons* exhibition, as well as additional educational programming taking place this spring to help teachers incorporate art into the Garden's life science-based field trips.



Garden Honors Go Daddy

The Garden honored Go Daddy with its **2012 Spirit of Philanthropy Award** at the Association of Fundraising Professionals Philanthropy Awards Dinner held November 7. "I am so pleased Go Daddy is being publicly acknowledged for all they do at the Garden," said Ken Schutz, executive director of the Desert Botanical Garden. "Go Daddy is a valued multi-faceted Garden benefactor—helping us acquire the Chihuly *Desert Towers* through a generous donation, sponsoring



Dinner on the Desert year after year, and providing ongoing website support."

Go Daddy, the world's largest provider of domain names and Web hosting, is a 12-year partner with the Desert Botanical Garden.

"The Desert Botanical Garden is one of those places you want every visitor in the Valley to see because it embodies the beauty of our desert in a way that's pretty special, not to mention educational," said Go Daddy Chief Human Resources Officer and Go Daddy Cares Chair Lane Jarvis.



May 14 - 18, 21 - 22, 24 - 25, 28 - June 1 / Desert Botanical Garden

Topia, an original ballet created by Artistic Director Ib Andersen, fuses nature and dance. The ballet is performed in an outdoor desert venue on an 80-foot panoramic stage. Andersen's brilliant choreography is set to the music of Beethoven's *Symphony No. 6*.

Tickets on sale at the Ballet Arizona box office, 602 381.1096 or ticketmaster.com.

BALLET ARIZONA
IB ANDERSEN ARTISTIC DIRECTOR

Garden members will receive 10% off their tickets when using promo code VIPTopia.

The 27th Annual Dinner on the Desert

Saturday / April 27 Dinner on the Desert will honor the Garden's timeless, treasured beauty and celebrate its 75th anniversary. The evening begins in Ottosen Entry Garden with a signature cocktail and warm welcome by Co-Chairs Jan and Tom Lewis. Enjoy the setting sun as you stroll to Dorrance Hall. Savor sumptuous hors d'oeuvres while you bid on distinctive plants, pots, garden art, and unusual and exciting experiences. The magical outdoor setting of the Garden—heightened by Philip Haas' extraordinary *Four Seasons* sculptures—is the stage for your evening of Garden-inspired cuisine. The party continues with music and a nightcap under the stars. *Tickets start at \$500. Reservations are limited. Please call Esther Battock at 480 481.8182 for more information or reservations.*

75 YEARS
and growing

DID YOU KNOW

The Garden shut down during WWII. Military units stationed in Papago Park often used the Garden for target practice.

Photo Credits

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Page 3	Desert Botanical Garden historical photos courtesy of the Schilling Library Archives	Page 7	(top-left), <i>Aloe dichotoma</i> - Adam Rodriguez	Pages 16 & 17	Photos by Adam Rodriguez
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		Page 10	Gulf Fritillary - Adam Rodriguez	Page 19	Dining inside Gertrude's restaurant - Adam Rodriguez
		Page 11	Historical plants near Webster Auditorium - Adam Rodriguez	Page 20	Ribbon cutting - Jesse Tallman
				Page 20	Students with Philip Haas - Jesse Tallman
				Page 21	<i>Topia</i> ballet dancers - Tim Fuller
				Back Cover	Garden Plant Sale - Adam Rodriguez

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The Desert Botanical Garden is grateful to all 28,869 members and donors for their support. Acknowledged in this section are annual support gifts from Curator's Circle, Director's Circle, President's Circle and Founder's Circle members and donors contributing \$2,500 or more over the year, from December 16, 2011 through December 15, 2012. Included are unrestricted gifts and memberships to support the Garden's annual operations.

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Honor and memorial contributions are used to provide for the Desert Botanical Garden's horticulture, education and research programs. Gifts may also be recognized with benches & plaques. These contributions have been received from September 16, 2012 through December 15, 2012:

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The Desert Botanical Garden Mission

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



WiFi Zone

FREE WI-FI is available in five locations within the Desert Botanical Garden: the area in front of Admissions, Ottosen Entry Garden, Boppert Courtyard, the Center for Desert Living Trail, and Ullman Terrace.

Partial funding provided by The Arizona Community Foundation.

Spring Plant Sale



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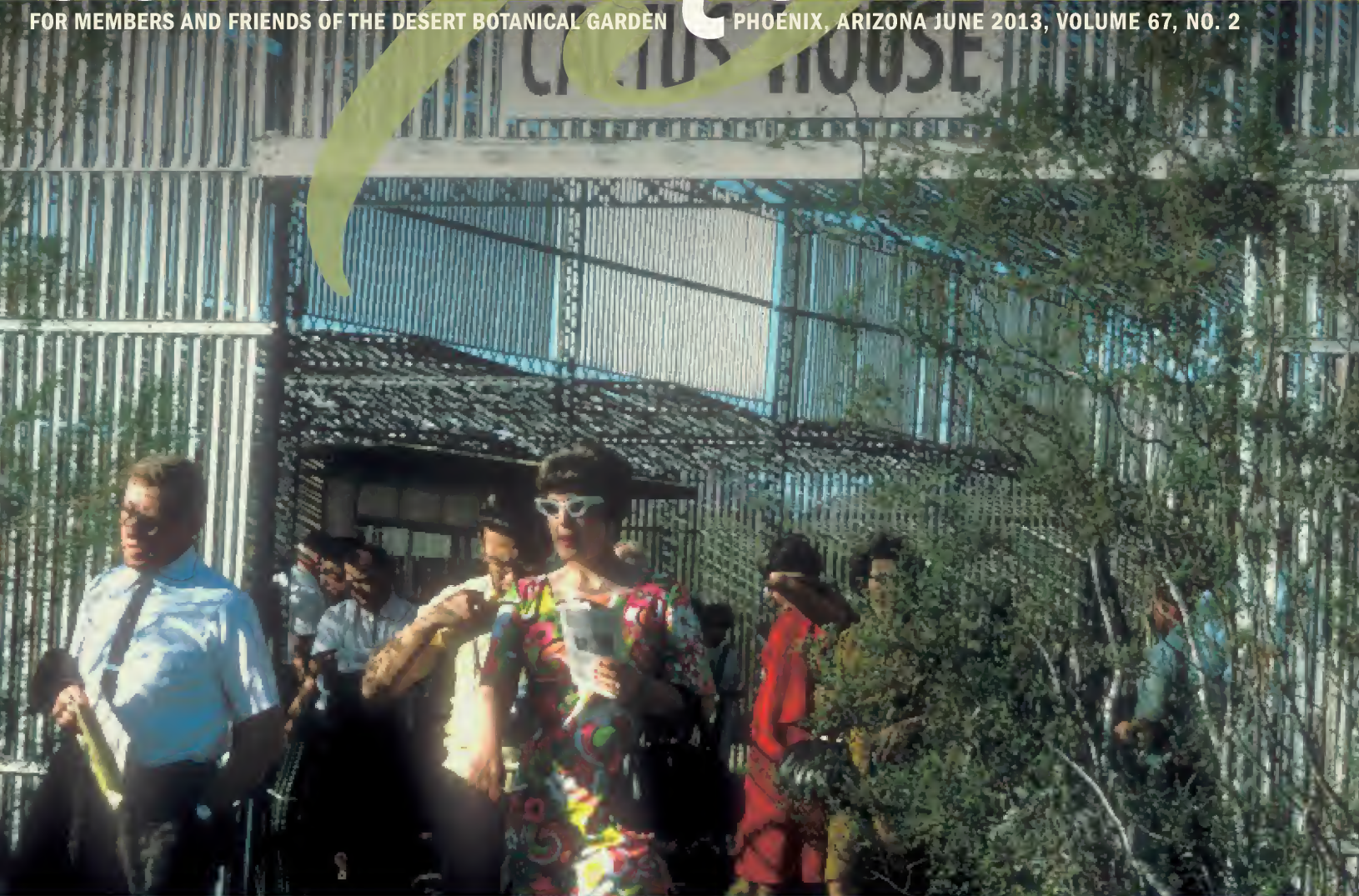
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DESERT BOTANICAL
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SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN PHOENIX, ARIZONA JUNE 2013, VOLUME 67, NO. 2





Our keynote speaker, retired Supreme Court Justice Sandra Day O'Connor, captivated the audience with her recollections of life in Arizona and the unique culture of the American West.



In the National Spotlight

Hosting the American Public Gardens Association Annual Conference

In May, the Garden enjoyed a special distinction that presents itself just once every couple of decades: we hosted the week-long annual conference of the American Public Gardens Association (publicgardens.org). As we took advantage of the occasion to showcase all that has happened at Desert Botanical Garden since the conference was last held in Phoenix in 1988, our colleagues were impressed with the many changes.

We also worked closely with our partner gardens at Boyce Thompson Arboretum State Park, the Arizona-Sonora Desert Museum, Tohono Chul, and Tucson Botanical Gardens to show off the entire state of Arizona, from Tucson to the Grand Canyon.

More than 600 registrants from public gardens around the country attended, renewing their associations at the 60 professional sessions that were presented throughout the week. The keynote speaker, retired Supreme Court Justice Sandra Day O'Connor, captivated the audience with her recollections of life in Arizona and the unique culture of the American West. Other distinguished presenters included HRH Princess Basma bint Ali of Jordan, who founded the Royal



Botanic Garden in that desert country, and Dr. Christian Samper, the president and CEO of the Wildlife Conservation Society in New York City.

Hundreds of volunteers in Arizona worked with the staff of the American Public Gardens Association, which is headquartered in Pennsylvania, to make the 2013 conference a success—I wish space allowed me to thank each by name. Unfortunately that's not possible, but I would like to acknowledge the extraordinary efforts of two of our staff members: Director of Development Beverly Duzik, who chaired the program selection committee, and Deputy Director

MaryLynn Mack, who served as the chair of the conference steering committee. I, too, received a special honor during the conference when I was elected to a two-year term as president of the American Public Gardens Association.

Our Garden's dual role of serving our local community and of participating in the national arena of public gardens is something of which we can all be very proud.

Ken Schutz,
*The Dr. William Huizingh
Executive Director*

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Desert Botanical Garden historical photos
courtesy of the Schilling Library Archives.

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GARDEN HEROES

Lou Ella Archer and Reg Manning

by Beth Brand, Librarian, Schilling Library

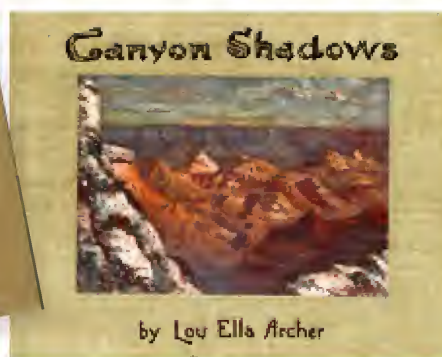
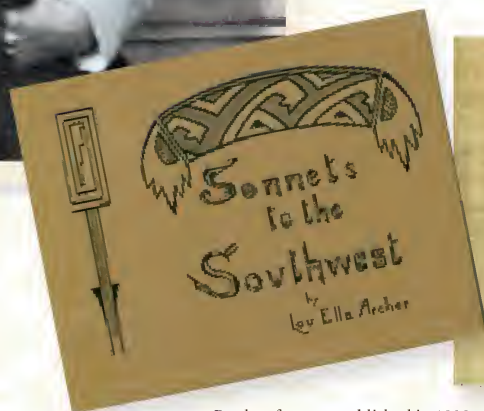
Some people live their lives to make a difference. They use their passion, talent, energy and wealth to leave something better for those who come after. For nearly 75 years the Garden has had many such generous supporters, but Lou Ella Archer and Reg Manning belong to a special class of leaders who were there from the beginning. During crucial times, they stepped up to ensure the Garden's success well beyond their lifetimes.



Lou Ella Archer, a Cheerleader for the Garden

A native of Minnesota, Archer was born in 1891 and brought to Arizona as a child. She attended elementary and high schools in the Valley, and then a finishing school in the East before returning to Phoenix in 1928. She grew up at what was known at the time as a Phoenix landmark, Palm Villa, which was situated on 20 acres at the northeast corner of Central and Thomas Roads.

During World War II, she was recognized for her work in civilian defense as chairman of the gas rationing board and for opening her home to entertain hundreds of servicemen training at nearby stations. Archer's generosity extended to humanitarian causes through her work as state commander for the American Society for the Control of Cancer and state chairman for the Red Cross. She helped new immigrants through the local charity Friendly House, funded animal shelters, and served on the board of the Humane Society.



Books of poetry published in 1930 and 1931.



Archer House today.



Archer House completed in 1952.

Archer developed a deep appreciation for the natural beauty of the Southwest as she traveled extensively. She paid tribute to the region in two books of poetry, *Sonnets to the Southwest* and *Canyon Shadows*. Additionally, many of her poems appeared in the Garden's first membership publication, *Saguaroland Bulletin*. Her desire to protect the desert would lead Archer to the Arizona Cactus and Native Flora Society. The June 1947 issue of *Saguaroland Bulletin* reported that "The first meeting of this Society was held at her home, and in the fullest significance of the word, she has a Founder's membership." In partnership with Garden founder Gertrude Webster, Archer helped plan the construction of the Administration Building (now Webster Auditorium), funded the construction of Archer House and, over the years, paid for many necessary Garden repairs and improvements.

From the start, Archer was an enthusiastic cheerleader for the Garden and was well-suited in her role as chairman of Garden publicity. In the July 1947 issue of *Saguaroland Bulletin*, editor John McChesney wrote, "She knew how to awaken the interest of other people in the desert and did it... with a weekly [radio] broadcast, *Arizona Highways*." A couple of months later, McChesney wrote again, this time encouraging Archer to get back to



promoting the Garden via the radio programs that had been discontinued during the war. She acted on his suggestion, returning to the airwaves to tell about the beauty of Arizona and the Valley's own Desert Botanical Garden.

Among her many contributions to the Garden, Archer's most critical came in 1947 after the death of Mrs. Webster. Following World War II, Garden membership was down to only 19 members, nearly spelling its end. Mrs. Webster's will would provide a substantial and much-needed endowment, but only if the Garden had at least 200 members. News of the stipulation prompted Archer to purchase 75 memberships, create a new "Benefactor's" membership, and enroll two new members at that level to help out. Archer's generosity and influence enabled the Garden to meet the membership goal required to receive Mrs. Webster's endowment and ensure that it would continue operating into the future. Without Lou Ella Archer, it is possible that the Desert Botanical Garden would not exist today.

GARDEN HEROES

Manning's passion for the Garden and its importance to the community spurred him into action.

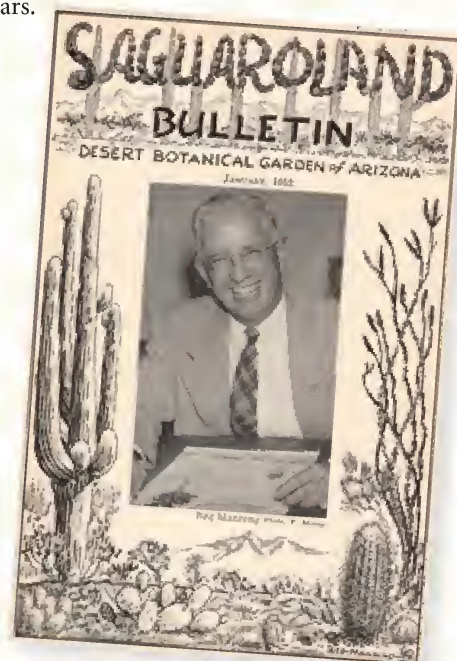
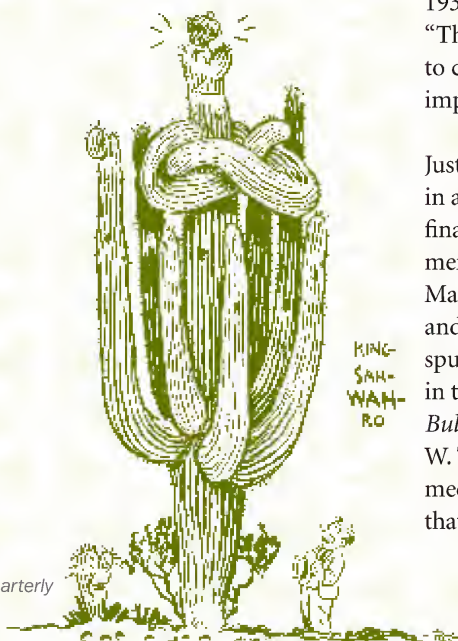
Reg Manning, Using Humor to Help Out

Reg Manning, another founding member, was born in Kansas City, Missouri in 1905. He moved to Phoenix in 1919 with his mother and brother, where he learned to draw in classes at Phoenix Union High School. He was hired by *The Arizona Republic* (then *The Arizona Republican*) in 1926, where he worked for more than 50 years. In 1951, he won a Pulitzer Prize for his editorial cartoon, "Hats," which was about the Korean War. In addition to his work at *The Republic*, he created six cartoons a week for McNaught Syndicate, which eventually published his work in more than 125 newspapers. During his long career, Manning received more than a dozen awards, visited and gave talks to soldiers, and spoke to students at college and university lecture series.

His entertaining books, *The Cartoon Guide to Arizona* and *What Kinda Cactus Izzat?*, humorously acquainted newcomers with the desert's prickly plants. For the Garden, he lent his artistic talent to membership forms, brochures, and anything that needed his signature smiling cactus. The *Saguaroland Bulletin* was named by Manning and featured his cartoons from the very first issue. In 1950, he created a stylized design that graced the cover for the next 27 years.

Manning took every opportunity to promote the Garden and, as editorial cartoonist for *The Arizona Republic*, made the most of his media connections. For instance, the day the Garden was dedicated, February 12, 1939, Manning used his topical feature "The Big Parade" to urge Phoenicians to come out to Papago Park for the important occasion.

Just after World War II, the Garden was in a fragile state both physically and financially; without income from new memberships, its future looked bleak. Manning's passion for the Garden and its importance to the community spurred him into action. An article in the August 1947 *Saguaroland Bulletin* reported how he brought Garden Director W. Taylor Marshall together with key staff at *The Arizona Republic*. That meeting resulted in the development of an ambitious promotions plan that included conducting membership drives, sponsoring annual cactus





shows, featuring regular stories, paying for and facilitating printing needs, lobbying for

better signs and roads to the Garden, and establishing a plan for a downtown cactus display outside *The Republic* building to stimulate interest in the Garden.

By May 1948, the design for the downtown garden was completed and ready to be implemented, using some cacti from Mrs. Webster's estate. During the same period, the promotions plan designed by Manning took off, giving the Garden a much-needed boost in publicity that helped it to survive through a difficult time. Success was demonstrated by the first *Republic*-sponsored cactus show, which brought in nearly 18,000 visitors even though it rained during two of the eight days. While he was board chairman in 1948, he also supplemented Archer's advertising efforts by making his own appearances on local radio.

Their Leadership Brought Benefits to All

It has taken many dedicated members and supporters to bring the Garden to its current level of distinction, but Lou Ella Archer's and Reg Manning's energy and continuous years of service are unparalleled. Archer served on the Board of Trustees from 1947 to 1967 and was its president during the last 10 years of her life. Manning served on the board from 1947 to 1976, acting as chairman for the first five years. They both spent their lifetimes supporting the Garden in every way, enabling it to achieve a level of growth and success they would not live to see, but which they believed all along could be achieved.



Part of the Archer Daniels Midland Company family, Lou Ella Archer was the first vice president of the Arizona Cactus and Native Flora Society. She was very active in the formation of the Desert Botanical Garden, hosting events, encouraging other founders, and sponsoring new members to insure its growth.

Created in November 1964, Mrs. Archer's will designated a number of monetary legacies, with the remainder going into a trust. After she passed away on February 11, 1968, Valley National Bank, the executor, distributed the trust income to her gardener and four friends for a period of years. Upon the deaths of these five income beneficiaries, the remainder passed to the Desert Botanical Garden and the Arizona Humane Society.

The final trustee and beneficiary, Mr. Keith Anderson of Denver, Colorado, passed away in June 2005. Archer's generous gift was realized by the Garden in September 2005. The Garden's "windfall policy" stipulated that her unrestricted gift be divided between the endowment fund and Garden operations. Assets over \$220,000 were then divided between the endowment, the Second Century Fund, and the Asset Replacement and Repair Fund.

Archer's generous gift of more than \$500,000 provided for the purchase of a new 4x4 vehicle for the research department, new garden furniture for Webster and Ullman Terraces, and equipment upgrades for the Garden Shop and the development department. Mrs. Archer made a significant contribution to the Garden's future with the majority of her gift being added to the permanent endowment. It continues to provide a perpetual stream of income to support Garden programs and operations.

Plan your own desert legacy with a visit to the Garden's website at dbg.org/membership-support/planned-giving or contact Susan Shattuck, gift planning officer at 480 941.3507, or sshattuck@dbg.org.

75
YEARS
and growing

DID YOU KNOW

The docent program at the Garden began in 1977 with 27 people.



Plant Stories from the Past Still Teach Today

by Ray Leimkuehler, Horticulturist II

Plants at the Garden often have a cultural value as well as horticultural, research, conservation, and educational value.

Their significance is frequently embedded in the stories that surround them and their places in the ecological-cultural landscape of both land and people. Many of the plants featured on the *Plants and People of the Sonoran Desert Loop Trail* have a long history of exactly that kind of ethnobotanical significance. Such stories can help us to understand the importance of plants in the daily lives and routines of people who lived in earlier times, times when the modern conveniences that we enjoy today were not yet thought of.

Here is a story of some of the significant plants that we find on the *Plants and People of the Sonoran Desert Loop Trail* and their many uses in a pre-industrial way of life. Following the story is a short analysis of how we might take meaning from it in today's world.

Not so long ago...

The tale begins in June when the wind mourns, oven dry, over the desert. This is the month when the Pima year begins. The desert withers in the heat; bighorns nod off under palo verdes, birds sing not, coyote cries not; the provision baskets are empty. All is silent. Only the rattlesnake is happy. Yet, in June the Earth does not forget her people in their plight, the desert provides, and when reserves are waning and rain is wanting, the red fruit on the saguaro opens up to bring respite.

Then it was that the Tohono O'odham enter the saguaro groves with their long harvest poles to pluck the fruits. As the fruits fall, so drop-like in shape, the question like a mirage formed: when will the rains come? In order to call in the rain, the O'odham prepare a ceremony with wine brewed from the saguaro fruits and sing for the storm clouds to come. The clouds hear the wine welcome, and they give their answer in turn, in thunder rumbling from black storm fronts piling on the horizon. Without these rains there would be no corn.



Rains came for the Tohono O'odham while to the north the rivers rose for the Akimel O'odham. And as the Akimel irrigated their fields, who among them could foresee that many of the corn varieties growing before them would be lost; canals dry up, and the river annexed by future settlers.



The corn is green and tall in September when the mesquites yield a second crop of bean pods. Shake the pods down from the branches, gather those that fall. Lay them upon the quern, pound them with the stone. Taste the flour. It is surprisingly sweet, ready to be baked, and then stored for another season.

Legend says that the first mesquite appeared with the union of bat and maiden and datura flower in a sacred house. There the mesquite grew till coyote ate the beans, distributing the seeds along the waterways. The mesquite woodlands prospered until they were decimated by settlers and ranchers for fuel and fence posts, so that the woodlands that took hundreds of years to root and grow were laid to waste in a few short decades.

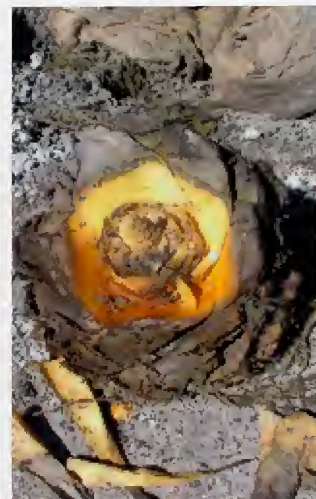
With the fall equinox the days begin to shorten, but the heat lingers still like an unwelcome guest. The white-flowered datura opens in the night, but soon she will have to sink into the earth and go to sleep. Danger veils datura, who is as deadly as she is beautiful. Voices from



Legend says that the first mesquite appeared with the union of bat and maiden and datura flower in a sacred house.

the past tell of datura leaves eaten by the Akimel in advance of the deer hunt, with songs sung to grant victory in hunting. Care must be taken, because datura is very toxic and can prevent one's heart or lungs from working. Few among the peoples partook of the leaves, and even then only at need—datura is avoided and regarded with respect.





Winter passes and the sun returns with the spring. The land is reborn and so is agave. Starches and carbohydrates are stored in the heart of the plant after years of growing. From the rosette, a bloom stalk climbs into the air. After this burst of growth, its life force is utterly spent and the agave dies. But look at the base of the plant. See how miniature agaves are sprouting from the base. These tiny agaves are clones! Agave never dies, but lives on again and again, life without end, a true miracle of nature. When harvested before the bloom stalk rises above the blades, the agave heart is roasted for three nights in a pit and eaten on the fourth day. Peeled like an artichoke, the agave leaves change from white-green to deep orange and taste like candied yams. Then June returns and the circle renews.

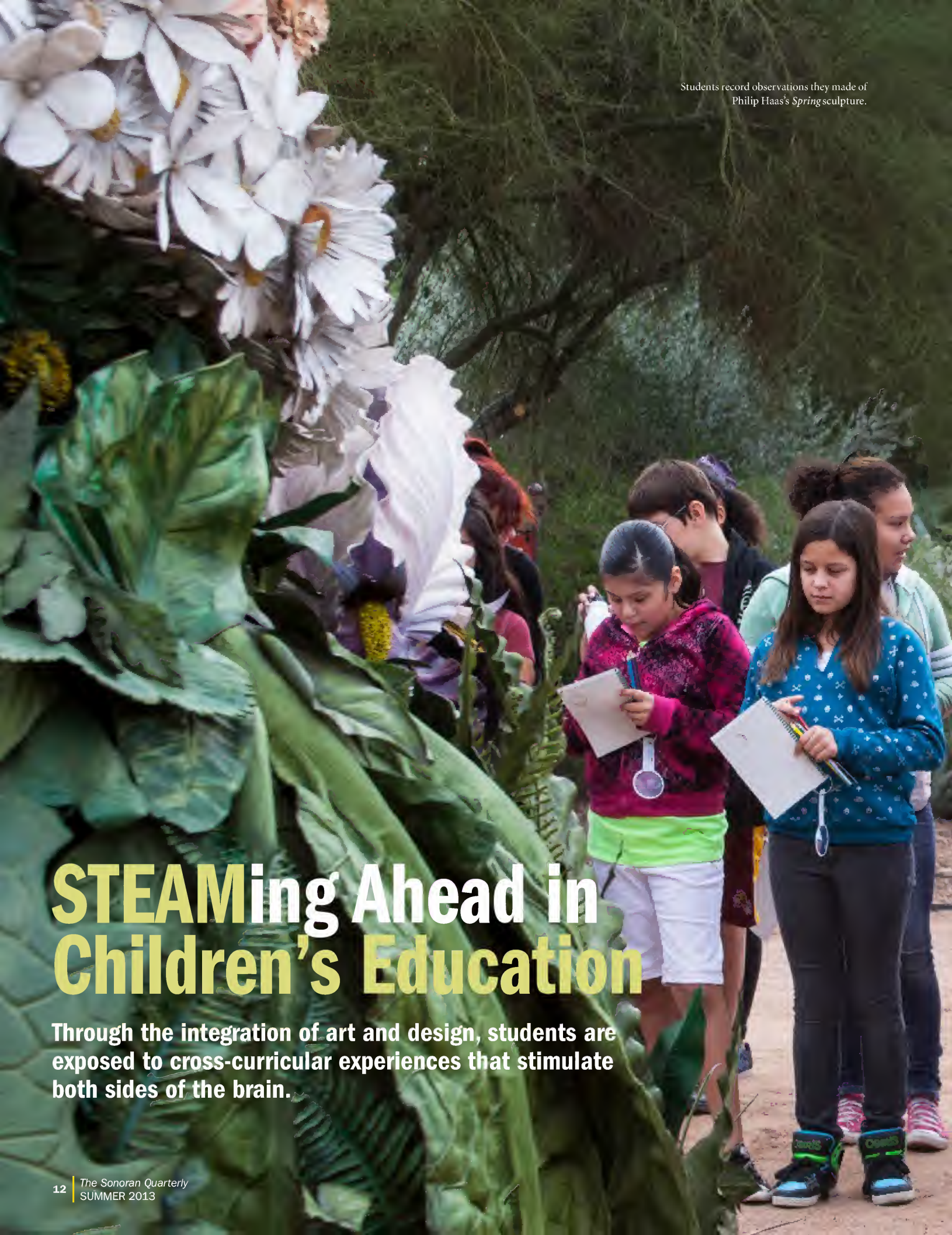
Learning from Stories

Stories such as the one above are interesting enough, but what can they actually teach us today?

The answer is this: we learn from such stories that once, not long ago, the earth provided for people. Life was hard, it always is in any age, but it was also beautiful and the people understood both where they were and who they were.

What was true for them is also true for us. As our world changes, we must also change how we interact with it in order to live in a sustainable harmony. We have found new crops to adapt to our arid environment; smarter ways to capture, distribute, and utilize water; renewable energies; and innovation through biomimicry: it is all there. And as we internalize the stories of older generations, stories that are embedded in the landscape, then we know where we are, and where it is we are going.





Students record observations they made of
Philip Haas's *Spring* sculpture.

STEAMing Ahead in Children's Education

Through the integration of art and design, students are exposed to cross-curricular experiences that stimulate both sides of the brain.

Imagine that you are on the *Plants and People of the Sonoran Desert Loop Trail* at the Desert Botanical Garden, standing in front of a mature saguaro cactus. You are asked to describe what you see. You note the cactus is tall...green...spiny...skinny...pleated looking...and has multiple arms.

Perfect, now dig deeper! Why does the saguaro look pleated? Is there a function connected to this shape? Does it help the plant do something? Because you visit the Garden often, you recall that the shape helps the cactus regulate its temperature by providing shade. The shape also allows for expansion and contraction, thus creating optimal water storage for survival during long periods of drought.

OK, let's go deeper still! Could the shape and design of the saguaro inspire you to solve a problem in your life? Is there something that would be more efficient or effective if the shape was like that of a saguaro? Maybe this shape would benefit a water storage vessel in your backyard? Or what if the walls of your home were formed in such a way that they provided maximum shade?



One student uses his viewfinder to highlight details in the artwork.



Examining a piece of sculpture close-up helps students understand the design process.

As you contemplate these questions, realize that you have just been introduced to two new educational concepts at the Garden; biomimicry and STEAM. Biomimicry is looking to nature as a model, measure (ecological standard), and mentor. Janine Benyus, leading authority in this field and the author of *Biomimicry: Innovation Inspired by Nature*, often refers to it "as consciously emulating nature's genius." Nature knows what works best and which forms, functions, and processes are the most sustainable. As humans, we can learn from these patterns through careful observation and attention to detail. These observations also raise questions and pique curiosity, leading us to be inspired by nature and to make sustainable improvements through innovative design. One well-known biomimicry example is the invention of Velcro®, which followed from observing how quickly and efficiently burrs attach to animal fur and human clothing.

The overarching theme can be thought of as STEAM (science, technology, engineering, art and math) education. This may sound familiar if you have heard of STEM, but with the addition of "A" for arts. Through the integration of art and design, students are exposed

to cross-curricular experiences that stimulate both sides of the brain. By incorporating art and design into traditional academic studies, educators are able to provide meaningful opportunities that promote the knowledge and skills that students need to have a positive impact of the world around them. During a guided tour at the Garden, students are challenged to ask questions, synthesize information, and draw connections while stretching their imaginations and creativity.

Children's education at the Desert Botanical Garden is fully embracing STEAM education and biomimicry through the launch of a new curriculum; *Nature as a Problem Solver* (grades K-3) and *Solutions Inspired by Nature* (grades 4-8). This new education initiative provides an experience very similar to the previously described evaluation of a saguaro in the Garden. In addition to observing desert plants, students carefully examine an art exhibit while discussing possible design challenges and artistic inspiration. The guided tour is supported by pre- and post-activities in the classroom to enhance the learning experience.

Ecological relationships, adaptations, and natural processes are at the forefront of children's education at the Garden. These topics require students to make connections among similar and sometimes widely differing concepts. As environmental educators, Garden staff excel as models to the teaching community for showing how cross-curricular concepts and systems thinking can help support new Common Core Standards in schools. The Desert Botanical Garden is looking forward to sharing biomimicry, STEAM education, desert plants, art and design, innovation, and creativity with the larger Phoenix community.

The Garden thanks JPMorgan Chase for supporting the development of the STEAM program and Act One Foundation for underwriting a pilot project to test the program in select schools.



by Matt King, Research Assistant

Top: Drs. Timm Hoffman, Joe McAuliffe, and Les McFadden explore a research site near Inverdoorn.

Inset: One of the many mountain vistas near Clanwilliam.

Bottom right: Standing above a quiver tree forest near Kamassies.

"I hate this country! I love this country!" We're driving back to Cape Town after a two-week excursion through the western half of South Africa. Now, at this time and place, farm workers have shut down major roads in protest of low daily wages. Stones have been hurled at oncoming traffic, major roads barricaded and blocked, fires set to farms. We're listening to a national news radio program trying to assess which roads will lead us safely home, while the issue of whether the country is crumbling is debated passionately by callers on the air. Timm Hoffman's exasperated cries of love and hate encapsulate the mood: a country possessing boundless natural beauty, biodiversity, and historical richness is still struggling mightily with violence, corruption, and inequality of wealth.

My two months in South Africa were an amazing journey. However, I would not do justice to my experience by ignoring these moments, the rawness of the physical landscape and the life which inhabits it, to instead paint a saccharine portrait of the country.

I was invited by Dr. Joe McAuliffe to assist with research in the Karoo Desert, found in the western half of South Africa. Twenty-eight hours and 10,900 miles after being dropped off at Sky Harbor Airport, we were greeted by plant ecologist Dr. Timm Hoffman in Cape Town,





South Africa. The Botany Department at University of Cape Town served as our home base in between three excursions into the field, with Hoffman as our indefatigable guide and collaborator throughout the trip. Table Mountain towers over the university, providing a stunning backdrop to the vine-covered buildings of the campus. This beautiful setting, however, belied some grim realities in the city below. High walls of razor wire, electric fences, and notices of protection by armed, private security forces were ubiquitous, and served as constant reminders of the impact of crime in the area.

Our first trip beyond Cape Town took us out of the lush gardener's paradise of the coastal region, as we traveled north into the Karoo. As soon as we summited the Great Escarpment, we were in a different world altogether, where low-statured succulent plants monopolize the hilly terrain. On closer inspection, one notices the countless varieties of species present, mostly consisting of the *mesembs* of the ice plant family (Aizoaceae). In one area, specialized members of this family grow exclusively, almost perfectly camouflaged in patches of white quartz gravel.



Top: The landscape en route to Inverdoorn. The Swartberg Mountains south of Prince Albert. Middle: A family of elephants in Addo Elephant National Park. Bottom: Dr. Joe McAuliffe takes field notes at a research site in Kapelsfontein.



Clockwise from Bottom: Author standing by a beautiful quiver tree outside of Paulshoek. Outside Tankwa Karoo National Park; Research site near Basjanskloof; Sunset on the Orange River.

We continued north to Paulshoek, a small rural village of around 500 people. Hoffman has been coming to this area every single month for more than 10 years to collect data on plants. At the time, it was around his 150th consecutive month. With the help of several local residents, he has amassed an impressive and detailed look into how plants are responding to environmental and human-related factors. Outside of Paulshoek, we visited one of my favorite spots of the whole trip: a forest of quiver trees (*Aloe dichotoma*) outside the village of Kamassies. These quirky and magnificent plants stand like sentinels in the valley, and to walk amongst them was unforgettable.

We were joined on our second excursion into the Karoo by Dr. Les McFadden, a professor of earth and planetary sciences at University of New Mexico, and a longtime collaborator of McAuliffe's. The four of us set out for 10 days to collect data on plants and soils in the Karoo. We would be brought closer to the rawness of the landscape than ever before. After a few days in wetter climates, we had entered one of the most stark and desolate places I have ever experienced, near the Tankwa Karoo National Park. Huge expanses of blackened desert pavements stretched on for miles, with almost no plants in sight. The wind blew fiercely, and jackals howled at night. Inside the park, we followed our guide and park ranger, Garrett. In less than an hour, we managed to get two flat tires and encounter both deadly snake species in the area: puff adder and the Cape cobra. As it would turn out, by the end of our two month trip we had seen as many snakes as Hoffman had seen in his entire career!

Our third and final adventure into the Karoo took us on a 2,500 mile loop around the western half of the country. The route took us to the coasts of both the Atlantic and Indian Oceans, to the waterfalls and vineyard-laden valleys of the Orange River in the north, and mountain passes along the southern border. Everywhere we went, we wondered how our experiences that day could be topped. Amazingly, it seemed that South Africa always had something new to offer. The people we encountered were as wonderful as the rich landscape that we had seen on our travels.

Hoffman's passion for the land and pride as a South African was, and still remains, infectious. As miles upon miles of countryside passed through the windows of our field vehicle, taking in the wonders of the Karoo, it's easy to understand his perspective. Though societal ills remain unresolved, the natural world continues to inspire us, waiting to be explored, understood, and above all protected.

After two months in South Africa, I left with new friends, a greater perspective of the world, and a lifetime of stories.

This trip was made possible thanks to the generosity of Trustee Emerita, Nancy Swanson.

MEMORIES OF DESERT BOTANICAL GARDEN

Good Morning!

Enclosed, please find a picture of my husband and me at the Garden celebrating our 40th wedding anniversary on Sunday, March 18, 2007.

The picture was taken in the Webster Auditorium and the renewal of vows was beforehand on the patio outside.

After the vow renewal we had dinner in the Auditorium with 20 friends and family in attendance. It was 88° that day (!) and we were on the patio by 4pm, I believe, so we were really glad that we had the Auditorium too, since it is air-conditioned.

We had a very wonderful and memorable day!

Sincerely,
Dale Ann Spear



Dear DBG,

Thank you so much for being a part of the Valley's beauty. You are forever a special place for my husband and me as you provided a gorgeous location for our wedding last year. Your staff was amazing, location for our ceremony and reception were perfect, and our guests had an absolute blast!

Attached are a few pictures from our wedding.

Thank you!
Stephanie Beck



ANNIVERSARY CELEBRATION HIGHLIGHTS

Community Celebration

Saturday, September 28, 2013:

Free Day. More information will be available in summer 2013 at dbg.org.

Desert Council Celebration

Sunday, September 29, 2013:

Free Day for employees of Desert Council Members at the Palo Brea and Palo Verde levels. Desert Council is an association of generous companies and organizations who support the Garden. For more information, contact Julie Wagoner, jwagoner@dbg.org, 480 481.8115.

Special Exhibition Events

Chihuly in the Garden

Opening Night Gala

November 8, 2013:

Gala proceeds will support *The Saguaro Initiative*. For more information, contact Marcos Voss, mvoss@dbg.org, 480 481.8179.

November 9, 2013:

Complimentary opening preview for Garden Fund and Patrons Circle Donors. For more information, contact Lauren Svorinic, lsvorinic@dbg.org, 480 481.8147.

75th Anniversary Luncheon

February 2014 (date TBA):

Garden Party with ticket proceeds benefitting *The Saguaro Initiative* and featuring two debuts: An update and republication of *Oasis in the City*, *The History of the Desert Botanical Garden* and new Honor Installations to enhance the Garden's named spaces and recognize our most generous philanthropists.

Desert Landscape School

A leader in sustainability since 1997

Designing, installing, establishing, and maintaining sustainable desert landscapes can sometimes be a challenge in the Sonoran Desert.

As a supporter of the Desert Botanical Garden, you are familiar with the beauty and gratification provided by well-designed landscapes. Additionally, ensuring proper plant establishment and care is an investment that can add considerable value to your property.

One of the goals of the Desert Landscape School program is to provide a means for members and the general public to select professionals who are trained and have shown proficiency in the design, installation, and care of sustainable desert gardens. Whether you are considering hiring a landscape maintenance company for your home, community, or homeowners' association, look for professionals who have successfully completed the Desert Landscape School program at the Garden and you will get the best value for your investment.

To become a trained professional in desert plant installation and maintenance, consider registering for Desert Landscape School. Registration for the 2013-2014 program is now open at dbg.org/landscapeschool. For more information, please email dls@dbg.org or call 480.481.8161.



Chihuly Returns to the Garden

We are delighted to announce that a new exhibition, *Chihuly in the Garden*, will open November 10, 2013 and run until May 14, 2014.

Enjoying worldwide acclaim, Chihuly is credited with revolutionizing the Studio Glass movement and elevating the perception of the glass medium from the realm of craft to fine art. He is renowned for his ambitious architectural installations around the world, in historic cities, museums and gardens. Chihuly's work is included in more than 200 museum collections worldwide including the Metropolitan Museum of Art, the Smithsonian American Art Museum and the Corning Museum of Glass. Major exhibitions include *Chihuly Over Venice* (1995-96), *Chihuly in the Light of Jerusalem* (1999), *Garden Cycle* (2001-12), de Young Museum in San Francisco (2008), the Museum of Fine Arts, Boston (2011) and Virginia Museum of Fine Arts, Richmond (2012).

He has often said, "I want my work to appear as though it came from nature so if someone found it... they might think it belonged there." The exhibition at the Desert Botanical Garden will provide an opportunity for discovery and surprise; as you walk along the trails, you will come across explosions of magnificent color, shapes and forms.

Garden member reservations and general public tickets will be available in fall 2013. Members will have the opportunity to make their reservations prior to the sale of general public tickets. Garden membership includes unlimited admission to the Garden and *Chihuly in the Garden*. Complete information will be mailed to members later this summer or visit dbg.org/chihuly. To receive updates subscribe to our newsletter or follow us on Facebook and Twitter.

Chihuly in the Garden is presented by JPMorgan Chase. Evening viewing of the exhibition is sponsored by APS.

Conservation Alliance

The Conservation Alliance, coordinated by the Garden, got off to a terrific start with the launch of its first community-based citizen science initiative, the North Mountain Plant Inventory Project.

Partnered with the Plant Atlas Project of Arizona, the City of Phoenix Parks and Recreation Department, and the Phoenix Mountains Preservation Council, the goals for the project are to document the floristic diversity of North Mountain Preserve for scientific, management, educational, and conservation purposes; to train community members as plant stewards; and to contribute findings to the Southwest Environmental Information Network (SEINet) to be used by scientists, decision-makers, and the public. We are excited to report that we are well on our way to achieving these goals.

Enthusiasm for the Project drew more than 25 community members who wanted to “join the nerdy ranks” by becoming budding botanists or to lead specimen collection teams as coordinating botanists. Budding botanist volunteers completed a two-day botany boot camp training where they learned a brief history of botany, plant taxonomy, scientific terminology, and proper field techniques.



Throughout the spring and now into early summer, these citizen botanists have been in the field collecting and documenting the flora of North Mountain Preserve. We are already sharing our findings through a dynamic flora available for viewing on SEINet by visiting bit.ly/nmtnSEINet. Those interested in learning more may visit the Project's Citizen Science Central webpage at bit.ly/nmtnplants.

The Conservation Alliance is generously supported by the Nina Mason Pulliam Charitable Trust.

Fossil Creek PAPAZ Flora Project

In the spring of 2013 a group of botanists and volunteers set out for Fossil Creek, designated as a Wild and Scenic River in 2009, to begin a central Arizona PAPAZ project. PAPAZ stands for Plant Atlas Project of Arizona, a partnership of the Arizona Native Plant Society, Grand Canyon Trust, Desert Botanical Garden, U.S. Forest Service, Northern Arizona University, and the Museum of Northern Arizona. The goal of PAPAZ is to document the floristic diversity of the state through the collection of plant specimens that will be kept at selected Arizona herbaria and will provide an Internet accessible, data-based plant atlas (SEINet) for Arizona based upon voucher specimens.

Using volunteers, or budding botanists, each project has professional botanists assigned to oversee the project and work with the volunteers. The volunteers are involved in the collection, identification, and mounting of the plant specimens.



The Fossil Creek Project covers more than 36,000 acres¹ and includes the Fossil Creek Wilderness on the Coconino National Forest, the Fossil Springs Botanical Area, and numerous hiking trails along the creek and surrounding areas. The plant communities range from desert scrub to ponderosa pine/Gambel oak and include riparian communities. To date we have been assisted by 10 volunteers in the collection of 370 specimens representing 67 families and 220 taxa.

¹ Fossil Creek State of the Watershed Report 2005 Northern Arizona University.

Photo Credits

Page 2 Ken Schutz - Jim Poulin
Page 3 Desert Botanical Garden
historical photos courtesy of the Schilling Library Archives
Page 4 & 5 Lou Ella Archer - Courtesy of the Schilling Library Archives
Page 5 Archer House 1952 - Courtesy of the Schilling Library Archives
Page 5 Archer House 2013 - Adam Rodriguez
Page 6 Book "What Kinda Cactus...": One of the Schilling Library's copies of Manning's popular book. Invitation: Manning's self-

portrait on the invitation to his 75th birthday celebration hosted by the Garden, April 28, 1980. *Saguaroland* cover: A new Manning design of the *Saguaroland* cover launched in 1952 featuring the artist's photo.
Page 7 Reg Manning, 1976 - Courtesy of the Schilling Library Archives
Page 7 Lou Ella Archer - Courtesy of the Schilling Library Archives
Page 8 *Plants and People of the Sonoran Desert Loop Trail* - Adam Rodriguez
Page 9 Agave and saguaro - Adam Rodriguez, Plucking saguaro fruits - Einav Henenson

Page 10

60-day corn - Ray Leimkuehler, Mesquite beans - Jeff Stemshorn, Sacred datura - Gene Almendinger
Page 11 Desert Storm - Ray Leimkuehler, Saguaro harvesting ramada - Adam Rodriguez
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Pages 14-16 South Africa Photos - Matt King
Page 17 40th wedding anniversary - Dale Ann Spear, Garden wedding - Stephanie Beck
Page 18 Desert Landscape School - Desert Botanical Garden

Page 18

Chihuly Desert Towers - Adam Rodriguez
Page 19 Scott Frische and Dawn Goldman examine species for the collection - Stacie Beute
Page 19 Pressing plants at Fossil Creek - Joni Ward
Back cover Visitors at Flashlight tour - Gene Almendinger, Echinopsis candicans - Adam Rodriguez
Correction: The photo of Wendy Hodgson on page 12 of the Spring 2013 *Sonoran Quarterly* was taken by Kate Watters, Grand Canyon Trust website.



SONORAN QUARTERLY

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Get the latest info for the Garden at



The Desert Botanical Garden Mission

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



WiFi Zone

FREE WI-FI is available in five locations within the Desert Botanical Garden: the area in front of Admissions, Ottosen Entry Garden, Boppart Courtyard, the Center for Desert Living Trail, and Ullman Terrace.

Partial funding provided by The Arizona Community Foundation.



Flashlight Tours

Thursdays and Saturdays

May 30 – August 31 / 7 - 9 p.m.

Included with membership or paid Garden admission.

Flashlight tours are a sensory adventure. You will see, hear, and feel the desert at night. The self-paced stroll along the main trail to 10 discovery stations is perfect for families and nature-lovers of all ages. For additional information, please call 480 941.1225 or visit dbg.org.

The Desert Botanical Garden will be closed Thursday, July 4, in observance of Independence Day.

New This Year!

Looking for something adventurous and educational to do for your child's birthday party this summer? Make your reservation today for a Flashlight Tour birthday party! *Recommended for children ages 4 and up.* Parties offered on Thursday and Saturday nights only, **May 30 - August 31.** For pricing and availability, please call 480 481.8159.



ALSO NEW THIS YEAR

Desert in the Dark Girl Scout Program

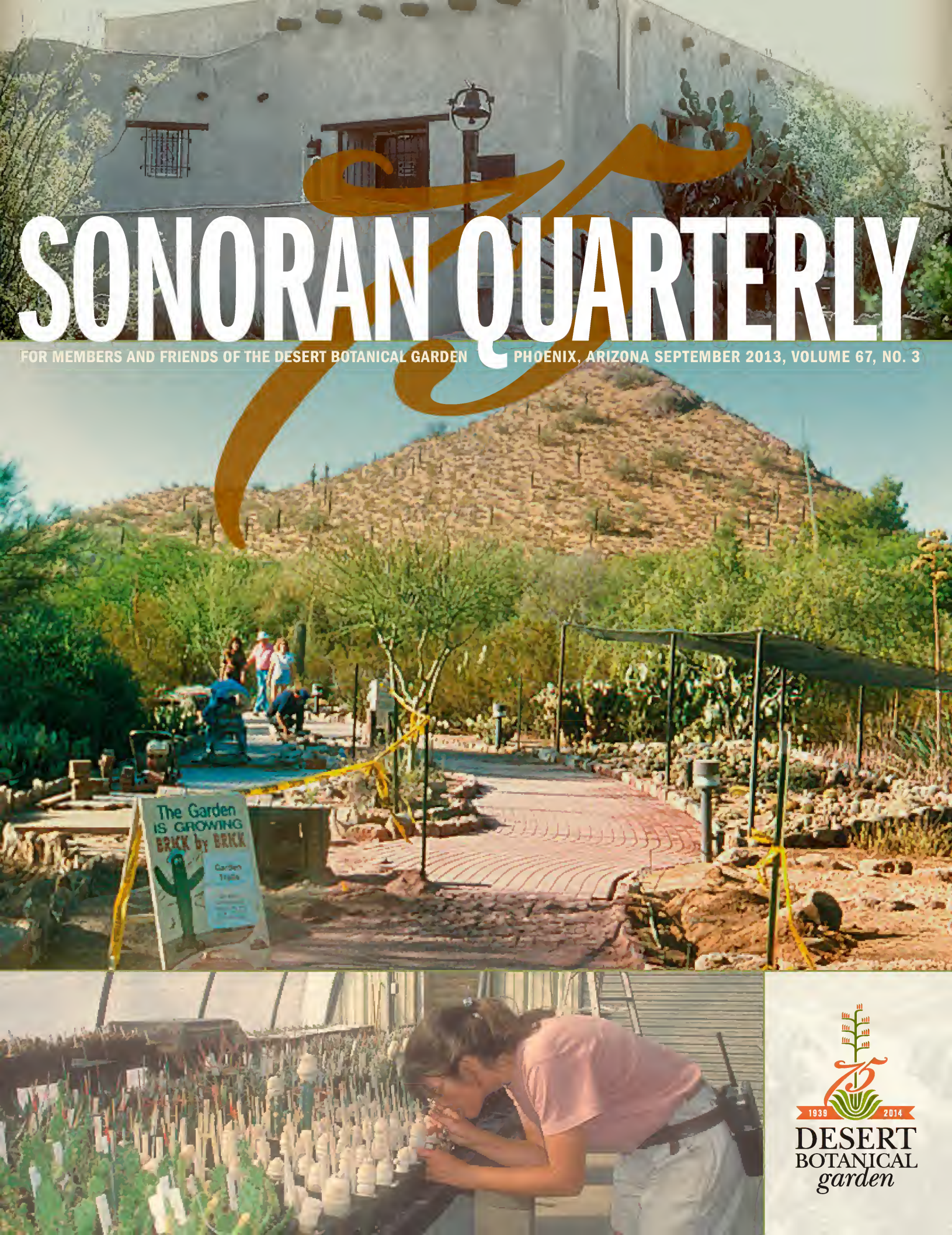
What is our desert like in the dark? Scouts will experience the Sonoran Desert at night while learning about the stars and nocturnal animals through this self-guided program. Participants will receive a participation patch as they complete activities that help them fulfill requirements to earn Girl Scout badges.

Thursday and Saturday / May 30 - August 31 / 7 - 9 p.m.

All levels of Girls Scouts are welcome.

Program fee: \$6 per scout and \$6 per chaperone

For additional information or to register, please visit dbg.org/girlscouts or call 480 481.8121.



SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN

PHOENIX, ARIZONA SEPTEMBER 2013, VOLUME 67, NO. 3

The Garden
IS GROWING
BRICK by BRICK
Garden
Trails



Please Support *The Saguaro Initiative*



We stand at the threshold of the next 75 years in the Garden's history, and what we set in motion now will be fully realized only after we are gone.



We are two-thirds of the way through our 75th anniversary year, and rapidly closing in on the actual anniversary date of February 21, 2014.

To me, the single most important aspect of the past eight months has been *The Saguaro Initiative*, which is a plan to invest \$18 million in the Garden's future. My article in this issue tells more about what the initiative will mean for the Garden's members and visitors—including spectacular new exhibits, state-of-the-art greenhouses for our rare and endangered plant collections, and innovative community-wide projects.

In a departure from tradition, my purpose here is to ask you to join me in supporting *The Saguaro Initiative* when the Garden contacts you later this fall. You will be joining 100 percent of our Board of Trustees and 100 percent of our senior staff in making an investment in the Garden's future.

Back in 1939 our founder, Mrs. Webster, spoke these words at the Garden's dedication ceremony, "We are building for this state now and for future generations," she



told the crowd. "You and I may not be here to see these gardens mature—but perhaps we can look down from heaven and enjoy them just the same."

The same dynamic is true today. We stand at the threshold of the next 75 years in the Garden's history, and what we set in motion now will be fully realized only after we are gone. Will you help us match the legacy that Mrs. Webster and her contemporaries

started in 1939? Please support *The Saguaro Initiative* and enjoy knowing that generations to come will look back on all of us with gratitude when they celebrate the Garden's 150th anniversary in 2089.

With respect and gratitude,

Ken Schutz
The Dr. William Huizingh
Executive Director

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On the Cover

Desert Botanical Garden historical photos
courtesy of the Schilling Library Archives.

Back Cover

NEW OUTDOOR EVENT VENUE AT THE GARDEN!

New Place! New Dates! New Times!

Fall Plant Sale / October 11 - 13

The Great Pumpkin Festival / October 17 - 20

Día de los Muertos / November 2 - 3



EXHIBITS IN THE GARDEN

A VISION FOR GENERATIONS

As part of the Desert Botanical Garden's 75th anniversary celebration year, we are looking back at our history and how each pillar of our mission—education, conservation, research, and exhibition—has been fulfilled. It is my pleasure to share with you some information about the history of the Garden exhibits that beautifully display our extensive collections of desert flora.

by Elaine McGinn,
Director of Planning
and Exhibits

Exhibits provide an important connection to visitors for communicating information about each of the four pillars of the mission. In many ways, all Garden activities converge in the public forum of the exhibition as they disseminate knowledge, make plant collections accessible, and provide an open-ended aesthetic experience for the visitor.

Guided by the original 1939 statement of purpose to display arid land plants and disseminate knowledge about them, and the commitment to become a compelling attraction (first stated in 1940), exhibits have seen many transformations over the years. With hard work, imagination, and

dedication, the Garden has met its philosophical mandate through an on-going evolution of creating new exhibits and enhancing existing exhibits.

The Early Years

Early exhibits consisted of display beds scattered throughout the Garden, which were accessed by a maze of trails. Those trails were initially dirt paths, later improved with asphalt. There was no interpretation and very few visitor amenities such as way-finding, seating, and shade islands. Development during this period consisted of amassing collections of desert flora from various locations throughout the Southwest and Mexico.



Maxine and Jonathan Marshall Butterfly Pavilion.
Photo by Adam Rodriguez.

What are now the iconic plants of the Desert Botanical Garden—the organ pipes, boojums, agaves, and cardons—represent the fulfillment of early efforts to create dynamic displays in a desert garden.

The Cactus House was built in 1950 to protect and display the more tender cactus and leaf succulents, and was considered state-of-the-art at the time. In 1965 the Succulent House was built, allowing the Cactus House exhibit to be dedicated exclusively to cacti.



Top photo: Saguaro ramada on the *Plants and People of the Sonoran Desert Trail*, opened in 1988. Photo by Adam Rodriguez.



Middle photo: Sensory Garden interpretive sign on *Center for Desert Living Trail*, 2013. Photo by Elaine McGinn.

Bottom photo: Interpretive sign on *Desert Discovery Trail*, NSF Grant. Photo by Adam Rodriguez.

Interpretation Comes of Age

In 1988, Ruth Greenhouse, then the exhibits coordinator, led the development of the *Plants and People of the Sonoran Desert Trail*. It was the Garden's first fully interpreted trail, with a focus on ethnobotany. The trail presented a series of five desert habitats, which for millennia have provided humans with useful plants. The trail included interpretive exhibits that told the story of desert plants and the people who used them. It continues to be recognized locally and internationally as one of the best outdoor exhibits for learning about ethnobotany.

In the early 1990s, Kathleen Socolofsky, the director of education, began planning a system of thematic trails throughout the Garden in preparation for its innovative transformation into a comprehensive science learning center. Using a visitor-centered approach to exhibit development, the trails were designed to entice visitors to learn about and value desert plants.





With support from a National Science Foundation grant, exhibit modifications included improved way-finding and orientation, the addition of visitor amenities, and the installation of more than 60 trailside interpretive exhibits about desert plant adaptations, conservation, and research. The project, completed in 1997, saw the implementation of interpreted trails that included the *Desert Discovery Trail*, the *Sonoran Desert Nature Trail*, and the *Center for Desert Living Trail*.

New Exhibits for the New Millennium

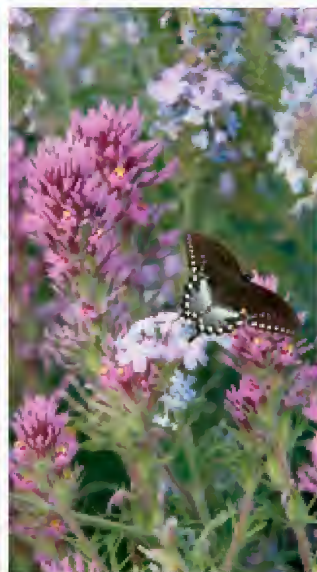
The new millennium brought many changes to exhibits in the Garden. The opening of the Garden's fifth thematic trail—the *Harriet K. Maxwell Desert Wildflower Trail* in 2001—reflected the growing emphasis on exhibit design and interpretation.

That same year, the new executive director, Ken Schutz, formed the Garden's exhibits department, once a part of the education department. It was my great honor to be asked to lead the department and oversee the transition of the exhibits philosophy: we would continue to develop and create permanent exhibits to showcase the living collections, and would also begin to develop seasonal and temporary exhibits to attract a broader audience.

In spring 2002, the first seasonal exhibit, the *Butterfly Pavilion*, opened. This 2,400 square foot structure featured hundreds of North American butterflies, luxuriant plantings, and the Garden's first bilingual interpretation. The response from the community was positive and the Garden saw a significant increase in visitation by families and school children.

Spring 2002 also saw the opening of the first sculpture show, *Dave Rogers' Big Bugs*, a whimsical exhibit of giant bugs made from wood. It set in motion the art exhibits program that positioned the Garden locally and nationally as an exceptional venue for sculpture shows.

Top left photo: Patrick Doherty, *Childhood Dreams*, sculpture installation, 2007. Top right photo: Dale Chihuly, *The Sun*, 2008. Middle left photo: *Spring*, from the Four Seasons, Philip Haas, exhibition, 2012. Bottom left photo: *Dave Rogers' Big Bugs* installation. Photos by Adam Rodriguez.



It is always rewarding to overhear visitors make that connection as they look at a sculpture and then point to a plant and say “Wow! Look at that!”



Mayme Kratz, *The Breathing Room*, installation, 2007. Photo by Adam Rodriguez.

Both the seasonal butterfly exhibits and the temporary sculpture shows have proved to be successful in broadening the Garden's appeal and attracting new visitors. For those who are not plant or garden enthusiasts, these exhibits provide other ways to connect with the desert environment. It is always rewarding to overhear visitors make that connection as they look at a sculpture and then point to a plant and say “Wow! Look at that!”

Over the past eleven years, a diverse group of artists who have exhibited their work in our unique garden setting include John Henry Waddell, Manolo Valdes, Mayme Kratz, Patrick Dougherty, Allan Houser, and Philip Haas.

In 2008, the Dale Chihuly exhibition, *The Nature of Glass*, opened to an overwhelming response from the community, drawing a record half million visitors. The Chihuly exhibit was such a success that he has booked an unprecedented return engagement. (See sidebar.)

CHIHULY | IN THE GARDEN

Presented by JPMorgan Chase

Chihuly at Night sponsored by APS

Supported by Act One Foundation

Chihuly in the Garden Exhibition

November 10, 2013 – May 18, 2014

Three time periods per day

8 a.m. - Noon / 12 - 4 p.m. / 4 - 8 p.m.

Garden Members

Free member reservations and ticket sales for member guests begin Monday, September 16.

Visit dbg.org/chihuly or call the Membership Helpline at 480 941.3517. Reservations highly recommended.

General Public

Adult: \$22, Senior: \$20, Student: \$12, Child: \$10

Children under three admitted free of charge

Visit dbg.org/chihuly or contact the Garden Call Center at 480 481.8188 to purchase a ticket. General Public ticket sales begin Monday, October 14.

Discovery and surprise await you on the Garden trails as you experience explosions of magnificent colors and shapes. Artist Dale Chihuly returns to the Desert Botanical Garden this fall with a stunning exhibition of his extraordinary and vibrant works of art. Chihuly is credited with revolutionizing the Studio Glass movement and elevating the perception of the glass medium from the realm of craft to fine art. He is renowned for his ambitious architectural installations around the world, in historic cities, museums and gardens. Chihuly's work is included in more than 200 museum collections worldwide including the Metropolitan Museum of Art, the Smithsonian American Art Museum and the Corning Museum of Glass. Major exhibitions include *Chihuly Over Venice* (1995-96), *Chihuly in the Light of Jerusalem* (1999), *Garden Cycle* (2001-12), de Young Museum in San Francisco (2008), the Museum of Fine Arts, Boston (2011) and Virginia Museum of Fine Arts, Richmond (2012). *Chihuly Garden and Glass* opened at Seattle Center in 2012.

Advance reservations are highly recommended to help ensure availability of your desired date, time period and parking spot. Limited walk-up tickets may be available. If a time period is sold out and you do not have a reservation or ticket, you may not be able to enter the Garden.

New Directions Result in New Displays

In 2005, in conjunction with planning for the major fundraising campaign *Tending the Garden*, staff, the Board of Trustees, and volunteers began a dialogue about opportunities and possibilities for the Desert Botanical Garden experience. We sought innovative ways to renovate existing and outdated displays. Our vision: that every element of the Garden reflect excellence and beauty, and to transform the visitor experience into one of discovery, inspiration, and appreciation for deserts and desert plants.

Generous *Tending the Garden* donors contributed \$3 million to renovate or create the following permanent exhibits from 2006 through 2011:

- The new *Sybil B. Harrington Cactus and Succulent Galleries*, which replaced the aluminum lath houses built in the 1950s and 1960s, contributed a dynamic venue for display and interpretation;
- Renovations to the *Ottosen Entry Garden* encompassed a series of four gardens that are designed to create a strong first impression for visitors, and to announce our unique desert experience;
- The creation of the *Berlin Agave Yucca Forest* highlights our world-class agave and yucca collections;
- Renovations to the Steele Herb Garden and *Center for Desert Living Trail* demonstrate practical applications for growing edible plants and gardening in the desert.

In addition to these renovations, the Garden also implemented a new way-finding system and in 2006, with a planning grant from the Institute of Museum and Library Services, updated interpretive signs and exhibit areas on the *Plants and People of the Sonoran Desert Trail*.

Fostering Creative Collaboration

Planning and exhibit development are inclusive and collaborative activities among staff, volunteers, board members, and outside consultants. Interdepartmental exhibit development teams include specialists in many areas: education, exhibits, horticulture, research, marketing, fundraising and design. As a project progresses, the teams expand to include landscape architects, construction contractors, and graphic designers, among others.



Left photo: Jan and Tom Lewis working with the design team on the Lewis Desert Portal project. Right photo: Center for Desert Living Trail exhibit team planning session.

Successful teams employ problem solving, creative thinking, adaptability, and open mindedness. It is not a linear process, and often requires many discussions about exhibit themes and goals, as well as brain-storming alternative solutions. Each exhibit process is unique and offers an opportunity to rethink and retool our efforts in both exhibit concepts and team-building.

Our living plant collections are the foundation from which we seek to invite visitors to learn about and understand desert plants in engaging and compelling ways. We recognize that simply redesigning our exhibits will not necessarily transform the visitor experience. Important conversations focus on key questions such as: How do we make the visitor experience meaningful? What do audiences want to see? What is the message we want to communicate? What are the outcomes or results of their experiences? Answers to these questions become the framework for exhibit planning and design.





Looking to the Future

In 2011, the Core Trail Master Plan was published, (see *The Sonoran Quarterly* Vol. 66, No. 1, 2012, p. 8-11 for article by E. McGinn or available at dbg.org/sqonline). which emphasizes the *Desert Discovery Trail's* role as the *core* of the Garden experience, brand, and message. It proposes exhibit enhancements to strengthen the overall experience by weaving together beauty, horticulture, education, research, and improved visitor amenities. This plan will be a guide for understanding and communicating the unique character and history of the Garden as we continue our efforts in imagining the future.

As we celebrate our 75th year, planning for new exhibits is well underway as part of *The Saguaro Initiative*. This initiative includes \$3.5 million for implementing three of the exhibit areas outlined in the Core Trail Master Plan: the Desert Terrace Garden, the Lewis Desert Portal, and the Heritage Garden. We will also open a new, expanded, seasonal butterfly pavilion adjacent to the *Harriet K. Maxwell Desert Wildflower Trail*.

Our guiding principal in planning and exhibits is to create a richness and diversity within the displays that invite a sense of discovery and visual excitement in the visitor. We are always looking for fresh ideas and new ways of building exhibits that will transform the relationship between the visitor and our mission...to create a *compelling attraction*.

Top left photo: Children exploring the *Harriet K. Maxwell Desert Wildflower Trail*. Top right photo: Sybil B. Harrington Cactus Gallery display of *Echinocereus triglochidiatus*, scarlet hedgehog cactus in bloom. Left photo: Ottosen Entry Garden. Photos by Adam Rodriguez.

75
YEARS
and growing

DID YOU KNOW

In 1983 the Garden was accredited by the American Association of Museums.

Subsequent reaccreditation occurred in 1999 and 2010.

The Saguaro Initiative

by Ken Schutz, The Dr. William Huizingh Executive Director

We are celebrating the Garden's 75th Anniversary with *The Saguaro Initiative*—an \$18 million plan to launch the Garden into its next 75 years. We are inspired to be bold by the Garden's Founders 75 years ago. By 2017, the Initiative will deliver the following:



Four New Exhibits

TOTAL INVESTMENT \$4 MILLION

- Desert Terrace Gardens—a canyon-like exhibit with towering desert plants.
- The Lewis Desert Portal—the new heart of the core Garden, providing stunning new plantings and functioning as the hub for all the trails in the Garden.
- The Heritage Garden—celebrating the Garden's historic plants and founding 75 years ago adding new plantings that will not fully mature until 2089.
- A new Butterfly Pavilion—located adjacent to the *Harriet K. Maxwell Desert Wildflower Trail* telling the story of these important pollinators.

New Horticulture Facilities

TOTAL INVESTMENT \$2.5 MILLION

Replacement facilities for optimal plant care and research providing new state-of-the-art greenhouses, shade structures, propagation areas, a new seed vault, plus learning spaces including a teaching greenhouse, exhibit space and classroom.

Community Outreach

TOTAL INVESTMENT \$1 MILLION

- Our Conservation Alliance brings together a network of organizations to save desert plants and provide stewardship for the mountain preserve systems in the City of Phoenix and Maricopa County.
- A Community Gardening program that partners with others in the valley—such as food banks and schools—to extend the Garden's expertise far beyond our own perimeter.

Institutional Planning & Advancement

Children | Family Garden Plan, Interpretive Master Plan and Communications

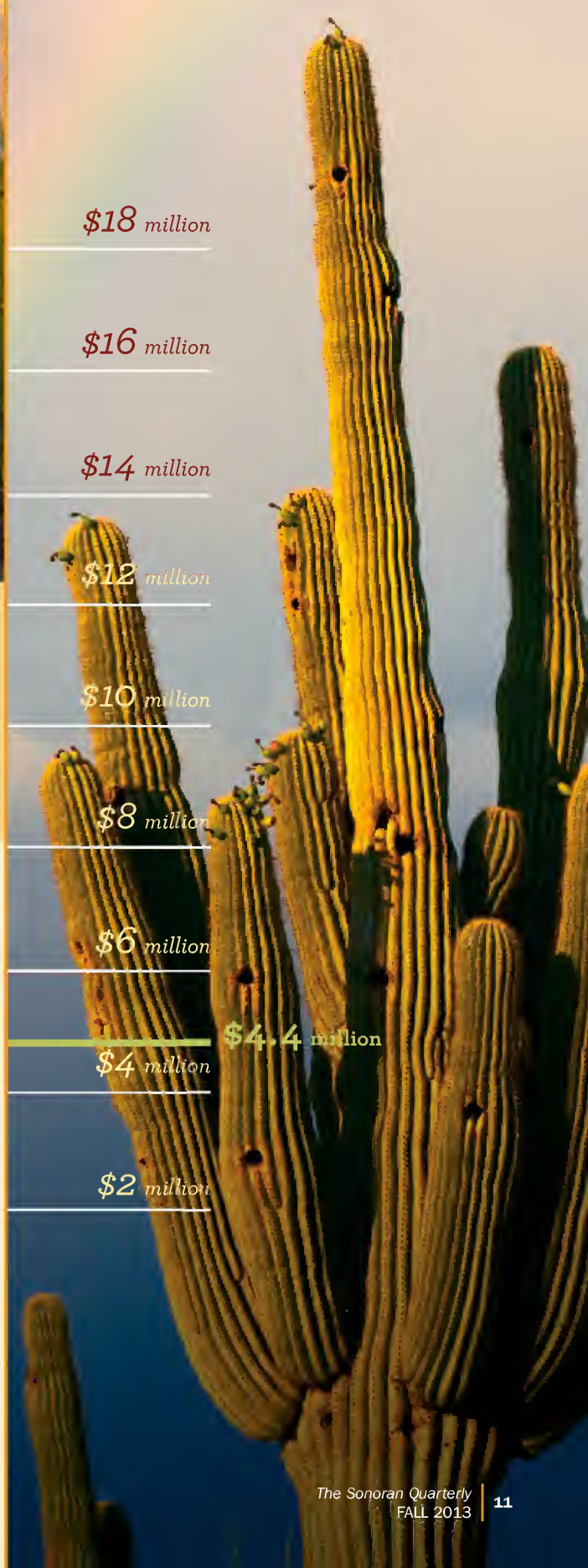
TOTAL INVESTMENT \$1.5 MILLION

There will be a Children/Family Garden at the Garden in the future—probably opening in the mid-20s. Our goal by 2017 is to completely design this new facility so that we are ready to secure funding for this exciting new initiative. We will also use these funds to create a new interpretive plan for the entire Garden, and to tell the story of *The Saguaro Initiative*.



Reaching the Goal

Gifts confirmed as of August 1, 2013



Endowment

TOTAL INVESTMENT \$9 MILLION

The Garden follows a very conservative fiscal policy, and only builds new facilities or launches new programs when it is certain it has the funds to support them on an on-going basis. As a matter of policy, the Garden raises \$1 in endowment support for each \$1 it raises for new capital projects and community programs.

Progress to Date

At this time, we stand at \$4.4 million raised, and many requests pending are with local foundations, philanthropists and corporations. This fall, we will invite each of our members to support these efforts, and I thank you in advance for considering our request that you, too, invest in the Garden's future through *The Saguaro Initiative*.

More details at saguaroinitiative.dbg.org.

75th Anniversary Cabinet

CHAIR

Bennett Dorrance

Rebecca Ailes-Fine

Kate Baker

Oonagh Boppart

Lee Baumann Cohn

Mike Cohn

Jacquie Dorrance

Barton Faber

Peter Fine

Hazel Hare

Barbara Hoffnagle

Martha Hunter


Jan Lewis

Tom Lewis

Harry Papp

Rosellen C. Papp

Ken Schutz



CANAL WATER PROJECT RESULTS IN A WIN

by MaryLynn Mack, Deputy Director

Conservation and protection of the desert environment is a core component of the Garden's mission and vision. This mission naturally extends to the conservation of water, a scarce resource in the desert.

Although the focus of the Garden's collections are drought-tolerant desert flora, supplemental irrigation is necessary because many of the Garden's plants are not native to this region and they are more densely planted than in the wild. Since the 1930s, the Garden has used tap water purchased from the City of Phoenix to supplement rainfall.

Over the last several decades, three factors have come together to impact the Garden's irrigation practices, providing impetus for a solution that will reduce costs and contribute to conserving limited water resources.

First, temperatures have risen in the Phoenix area, especially at night. The "heat island" effect of the growing city and generally higher temperatures has resulted in an increased need for supplemental watering. Secondly, the collection has become more diverse, more densely planted, and has increased in size. These changes also necessitate more water usage. Finally, the quality of potable water is suitable for human consumption,

but is not necessarily the best choice for long-term sustainability of plant life in a garden environment. We now know that the long-term use of potable water for irrigation has contributed to increased alkalinity and salinity in the soil, threatening the health of some plants.

Partners at Work

The Canal Water Project will allow the Garden to use nonpotable water from the Grand Canal for irrigation, in place of potable drinking water. This innovative project was led by three of the Garden's Board of Trustees — Barton Faber, FABERcapital, John Burnside, Esq. of Poisinelli Shughart PC and Barbara Hoffnagle, a retired executive from Salt River Project. They provided the cost/benefits analysis and worked with partners, contractors and Garden staff to make the vision a reality. Thanks to an innovative new loan program from the Arizona Community Foundation (ACF), the Garden completed construction of the project this summer at a total cost of \$350,000. Water from the canal will be supplied at a lower rate



From top left working clockwise: 1 and 2. Excavation at SRP canal for water delivery gate and piping to Desert Botanical Garden property; 3. Close up of dam to hold canal water out of project; 4. Broad view of dam; 5. Installation of standpipe on Garden property to connect to SRP pipe; 6. Placing SRP pipe at water delivery gate at the canal.

than regular tap water, resulting in savings of \$75,000 annually in irrigation costs. Thus, the project is expected to pay for itself over a five year period. Using water from the Grand Canal will also allow more control over alkalinity, resulting in increased health and vitality for the plant collections.

ACF has a multi-million dollar charitable loan pool that makes investments in nonprofit community projects. ACF's investments help organizations like the Garden achieve economies of scale and expand successful programs. ACF's new loan program, entitled the Community Impact Loan Fund, is a charitable vehicle that works alongside conventional grant-making toward dual goals: producing measurable social impact and building reusable monetary resources for the future. As loans with below-market interest rates are repaid, funds grow and become available for other projects, creating a continual recycling of charitable capital.

Salt River Project (SRP) began the initial engineering work for the project in January of this year and finished the pipeline construction and build-out from the Grand Canal to the Garden in just a few weeks. The remaining work was done by R.H. Dupper Landscaping Inc., Hines Irrigation Consultants, and

Garden staff over the summer months. With a new pump system and split irrigation lines (potable city water and nonpotable canal water), our plants will begin receiving water from the canal by this fall.

Benefits Beyond the Collection

Increases in water use are expected in the near future as a result of exhibit expansion, as outlined in the Garden's five-year strategic plan and 20 year master plan. By using water from the Grand Canal, money saved from reduced water bills can be used to enhance programs in education, research, and conservation, effectively giving the savings back to the community. In addition, the canal water system will increase the Garden's effectiveness in promoting water conservation and show that it not only "talks the talk," but also "walks the walk" on wise water use.

As we continue to celebrate our 75th Anniversary, you will read stories about the founders, volunteers, and community leaders whose passion, talent, and energy left us an amazing legacy. Sensible operational improvements like the Canal Water Project demonstrate that we, too, will contribute to that legacy as we continue to strive for solutions and ideas that will leave your Garden and your world a better one for those who come after.



Caring for the Cactus and Agave Collections

by Brandi Eide, Collections Manager

Many valuable roles are served by the Garden, perhaps most importantly the preservation of biodiversity through the care and propagation of its living collections. The collections include many irreplaceable plants, and in some instances, we care for more individuals of a given species than currently exist in the wild. Increasingly, botanical gardens and arboreta play an especially critical role in the conservation of species.

The Garden's cactus and agave collections were recognized by the North American Plant Collections Consortium (NAPCC) in 2010 with the designation of both families as National Collections. Members of the NAPCC form a network of botanical gardens and arboreta that work to preserve plant material and to promote high standards of plant collections management. This designation acknowledges the fruitfulness of the Garden's commitment to these families over its long history (see *The Sonoran Quarterly* Vol. 64, No. 4, 2010, p. 4-7 for article by R. Puente or available at dbg.org/sqonline).

The Cactaceae collection currently includes 1,422 species and varieties, and the Agavaceae collection 376; these are two of the most diverse collections of either family worldwide. These two families represent over half of our entire living collection. In addition to their size and scope, the quality and quantity of associated data makes them highly useful for scientific research. With this stewardship comes great responsibility, not only for the care of these plants, but also for the perpetuation of their lineages. This mandates our careful observation and protection, as well as a strategy for propagation and distribution to other institutions, ensuring that sensitive taxa are held in several locations.

Here, then, is an update on some of the work involved in caring for these nationally recognized collections.

Critical Work Takes Place Behind the Scenes

In 2012, the Board of Trustees approved the new Living Collections Plan, representing several years of work by the Research, Collections, and Horticulture Committee chaired by Shelley Cohn. This plan now guides our decisions on caring for and increasing the size of our collection (see *The Sonoran Quarterly* Vol. 66, No. 4, 2012, p. 4-6 for article by Dr. Joe McAuliffe or available at dbg.org/sqonline). Part of developing the Living Collections Plan was a multi-year examination of the cactus and agave collections resulting in the creation of the Garden's "Red List," which identifies species represented in our collection by only one to three plants. This list, a living document, shows us where to emphasize propagation efforts in the effort to prevent their loss.

We are currently working on an exhaustive inventory of the collections on display and in the propagation area. Knowing exactly what we hold in the collections allows us to analyze and advance their diversity. For instance, through this inventory we identified which plant species are held only in the propagation areas, with some existing only in seed form. After determining which species can survive Phoenix's ambient temperatures,

Left photo: *Echinocereus triglochidiatus*. Photo by Adam Rodriguez.



Photos left to right: New cactus shade house interior. Photo by Raul Puente. Agave seedlings grown to prevent local extinction. Photo by Brandi Eide. *Agave zebra* in Berlin Agave Yucca Forest. Photo by Adam Rodriguez.

we have begun to grow out those that are currently being held in the seed bank, and to collect, purchase, or obtain from other gardens those species not yet represented in the collection. Additionally, extensive mapping of both collections throughout the Garden is nearly complete, enabling us to accurately locate, track, and identify each plant.

Properly caring for plants held in reserve for growth and propagation is also an important element of our work. That task was made more effective in 2012, thanks to a generous estate gift from Patricia Dickerman that provided a new, behind-the-scenes, 4,000 square foot shade structure for the outdoor cactus collection.

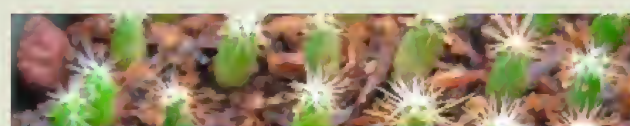
As we continue to improve and increase our collection, some critical guidelines have proved to be useful. One example is that plants added to the collection must be able to withstand local climatic conditions. Another is to increase the diversity of the collections by maintaining a minimum of three genetically distinct plants of each species, and to seek representatives from different plant populations having a unique genetic makeup.

This can be problematic, as some species are difficult to obtain for a number of reasons. However, through collecting trips, exchanges with other gardens and institutions, and the purchase of seed and plants from specialty nurseries offering legally propagated plant material, we can increase our collection's breadth and depth.

Keeping up with Growth

We are faced with many challenges in trying to provide for the needs of a diverse collection. A few conditions cannot be controlled and must be worked with. Examples include intensified sun exposure and plant sensitivity over the years, and increasingly higher nighttime temperatures. However, some modifications can and are being made to improve irrigation water quality, environments in the propagation areas, pest and predation issues, space and staffing constraints, constant record keeping, and nomenclatural research.

This fall, the Garden will begin receiving untreated water for irrigation directly from the the SRP canal, which forms the Garden's eastern boundary. In addition to saving the resources required in treating the water to make it potable and transporting it back to the Garden, the lack of added chemicals will be far better for the plants, as well as less expensive.



	Cactaceae	Agavaceae
Total number of plants	13,678	3,995
Total number of accessions	4,270	1,747
Number of genera	116	11
Total number of species	1,422	376
Number of hybrids	84	32
Number of seed accessions	1,363	434

Increasing our collections' scope and biodiversity is made more feasible with adequate facilities. To that end, as part of *The Saguaro Initiative*, we are now engaged in planning new propagation areas, including greenhouses and shade houses, which are in particular need of updating and expansion. Improved climate control is an especially critical need, as the current system is inconsistent in controlling climate requirements. Without adequate space and equipment, the quality of care, amount of propagation, and degree of diversity is restricted. Construction of state-of-the-art propagation facilities will help to prevent local extinction and improve the quality and diversity of the living collections.

The Garden has both the privilege and responsibility of maintaining world-class collections of nationally recognized agave and cacti, the importance of which cannot be overstated. The collections are the very foundation that supports the pillars of the Garden's mission in conservation, research, education, and exhibition. Through careful planning and stewardship of resources, the Garden will continue to hold and expand these dynamic collections for future generations.



Only in **ARIZONA**

Searching for the State's Unique Botanical Treasures

Quick!

What natural treasures are found in Arizona and nowhere else?

The Grand Canyon?
Check!

The Red Rocks of Sedona?
Check!

Over one hundred fifty endemic plant species?
... could you repeat that??

by Dr. Kimberlie McCue, Program Director, Conservation of Threatened Species and Habitats

Several years ago Garden researchers started thinking about plants that grow only in Arizona. We knew there were many, but we didn't know exactly how many, what they were, or where they were in the state. And, for conservation purposes, these are actually some pretty important questions. For example, endemic species, those that occur only in geographically limited areas like a single state, tend to be more vulnerable to threats. Conservation strategies, however, can't be developed to protect them if we don't even know what they are or where they occur. Thinking beyond protecting just individual species, scientists elsewhere in the world have found that by identifying and protecting areas that harbor many endemics in one group (like plants) it is highly likely that vulnerable species in other groups (e.g. reptiles, birds, mammals) will also be protected.

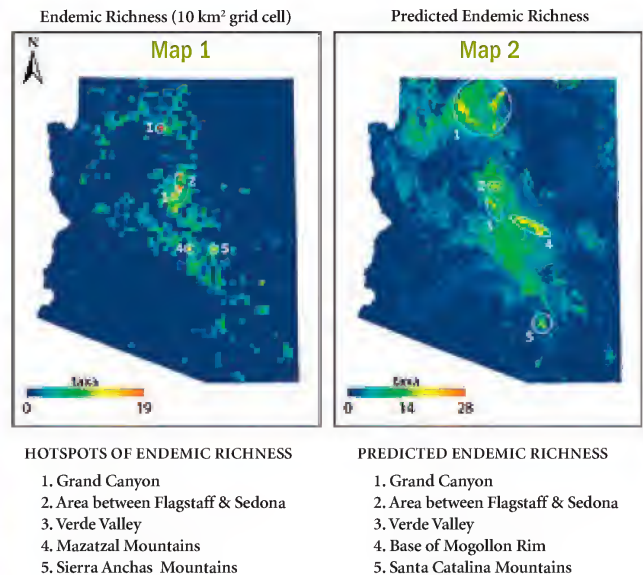


Photo 1: A close relative of the rarely seen *P. linarioides* subsp. *maguirei*.
Photo ©Al Schneider, swcoloradowildflowers.com.

Why would we think there were very many endemic plants in Arizona in the first place? First, Arizona has one of the most diverse floras in the United States, with approximately four thousand plant species growing in environments as diverse as the low elevation Sonoran Desert to high elevation alpine tundra. This type of habitat diversity often harbors high numbers of unique species. Second, some of the Garden's botanists had firsthand knowledge of some of Arizona's endemic plants. And, third, the authors of the *Arizona Flora* (Kearney and Peebles, 1960) suggested that roughly four percent of the plants in Arizona were endemic. However, they didn't provide a list of what those species were. Drats!

Arizona Endemics Hotspots

Map 1 and Map 2



So, with a grant from the National Fish and Wildlife Foundation, Garden researchers set out to identify all the plants that make their home only in Arizona. In essence, we were going on a botanical treasure hunt.

The Clues

Herbarium Curator Wendy Hodgson and Assistant Herbarium Curator Andrew Salywon did what any good treasure hunters do before going out to dig. They went to the library. They read descriptions of plants that were first described from collections in Arizona, they consulted references like the *Flora of North America*, and they combed through the *Arizona Flora* looking for plant species not reported in other states. From their research they created a working list of over two hundred plants that were candidates for Arizona endemic status.

The next step in the hunt for endemics was to verify that the plants on Wendy's and Andrew's list truly occurred only in Arizona. To do this, Research Assistant Matt King began pulling together location data for all the plants on the working list. His first source of information was SEINet (Southwest Environmental Information Network), a database of herbarium records from over two dozen herbaria (collections of pressed, dried plants). Most of these records included latitude and longitude coordinates, which allowed the exact location of the collections to be placed on a map. Volunteers Jane and Steve Williams determined latitude and longitude for 2,400 collections that had only descriptive locality information (e.g. "near the town of Superior"). Additional location information was provided by the Arizona Natural Heritage Program, Navajo Natural Heritage Program, and the National Park Service.



Photo 2: San Francisco Peaks ragwort, *Packera franciscana*.
Photo ©Anthony Mendoza.

**WE THINK OF ENDEMIC
PLANTS AS TREASURES
BECAUSE THEY ARE RARE
AND THEY ARE UNIQUE.
EACH HAS A STORY AND
TOGETHER THEY ARE
PART OF THE NATURAL
HERITAGE THAT MAKES
ARIZONA SPECIAL.**

Creating Treasure Maps

With tens of thousands of specimen locations in hand, Matt began to plot them all on a map. Very quickly we could see that some of the plants on our candidate list actually had been found outside Arizona. Those were removed from the list, with one exception. Maguire's penstemon (*Penstemon linarioides* ssp. *maguirei*) is a plant that had been documented in New Mexico but has not been seen there in over one hundred years (Photo 1). We decided to include it on our list as an Arizona endemic so that its rarity and plight would receive attention.

Once we had weeded out (no pun intended!) the plants that occur both in *and* outside Arizona, our list of endemics stood at 167. Amazingly, this is very close to the four percent of the total flora that Kearney and Peebles suggested was endemic back in 1960! This list of Arizona plant endemics is the first of its kind. No one has previously brought together all the known specimen location data for Arizona and vetted which plants occur only in this state.

Now that we knew the "what," and the "how many," we were ready to map out the specifics of the "where." Using a Geographic Information System, Matt was able to construct a series of highly informative maps. For each plant on the endemics list, he created a map showing all its known locations. He then used a technique called "distribution modeling" to create a map of the places the plant was most likely to occur. These "prediction" maps take into account many factors, such as rainfall, temperature, and topography to predict where the plants may be based on the places we know they occur. Maps were also created showing the occurrence of endemic plants on lands in Arizona managed by the Bureau of Land Management, National Parks Service, National Forest Service, and the U.S. Fish and Wildlife Service. Lastly, Matt created a map showing the endemic hotspots, the places in the state with the greatest concentrations of endemic plants, and a prediction map showing where the hotspots would likely be if we could locate every occurrence of each endemic (*Map 1 and Map 2, page 17*).

A Few of the Arizona Treasures

We think of endemic plants as treasures because they are rare and they are unique. Each has a story and together they are part of the natural heritage that makes Arizona special. Plus, as already mentioned, they may also help us determine where our conservation efforts will have the greatest impact.

Of the 167 endemic plants in Arizona, eight of them are listed under the federal Endangered Species Act (ESA). The San Francisco Peaks ragwort (*Packera franciscana*) is a federally

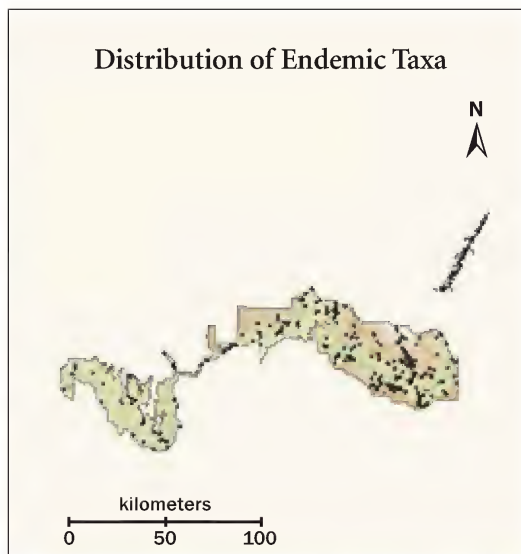


Photo 3: Sentry milk-vetch, *Astragalus cremnophylax* var. *cremnophylax*. Photo courtesy of The Arboretum at Flagstaff.

listed threatened species that is known to occur only in the San Francisco Peaks and which our distribution model indicates is unlikely to occur anywhere else in the state (Photo 2). Although this species is extremely rare, the plants themselves are quite hardy. The primary threats to this plant are trampling and habitat destruction by hikers, much of this occurring because of off-trail hiking.

The Sentry milk-vetch (*Astragalus cremnophylax* var. *cremnophylax*) is listed as endangered under the ESA (Photo 3). This diminutive member of the pea family is restricted to sites that overlook the Grand Canyon. Like the San Francisco Peaks ragwort, the major threat to this plant is trampling, primarily by visitors to Grand Canyon National Park. The simple act of erecting some strategic fencing has helped lessen this threat.

The Sentry milk-vetch is just one of 52 endemic plants that occur in the Grand Canyon (Map 3). This concentration of endemics is what makes the Grand Canyon one of the endemic hotspots



Map 3. Grand Canyon National Park. Points show locations of endemic plant species in the canyon.



Photo 4: Grand Canyon century plant, *Agave phillipsiana*, discovered by Wendy Hodgson. Photo courtesy of Desert Botanical Garden.

HOW DID THESE PLANTS COME TO OCCUR IN ARIZONA AND NOWHERE ELSE? WHY HAVEN'T THEY SPREAD TO AREAS BEYOND THE STATE? THESE ARE TWO OF THE MOST COMMONLY ASKED QUESTIONS WHEN GARDEN RESEARCHERS SHARE THIS WORK.



in the state. Other endemic plants from the Canyon include the Grand Canyon century plant (*Agave phillipsiana*), discovered by Wendy Hodgson (Photo 4), the Brady pincushion cactus (*Pediocactus bradyi*) (Photo 5), and the Kaibab Plateau Indian paintbrush (*Castilleja kaibabensis*) (Photo 6).

One endemic plant that readers may be particularly surprised to learn about is the Canelo Hills ladies' tresses (*Spiranthes delitescens*) (Photo 7). This is a species of orchid that grows in wetland areas, known as cienegas, in southeastern Arizona. (see *The Sonoran Quarterly*, Vol. 65, No. 2, 2011, p. 4-7 for article by Drs. S. Fehlberg, A. Salywon and K. McCue or available at dbg.org/sqonline). Although there are a few dozen types of orchids that can be found in Arizona, only this one, *Spiranthes delitescens*, is unique to the state.

If you are wondering if any of our prediction maps led us to treasure, the answer is, yes! Using the prediction maps for Jones' wild buckwheat (*Eriogonum jonesii*) and the Kaibab agave (*Agave utahensis* ssp. *kaibabensis*), previously unrecorded populations of each of these plants were found on the Kaibab Monocline, in the Kaibab National Forest (Photo 8).

Surveys were also done for several other species on our list and while we did not find any of those plants, the prediction maps did lead us to areas that appeared to be suitable for the plants we were seeking. Many factors could have played a role in specific plants being found or not during a particular survey. For instance, some cacti, when conditions are less than ideal (e.g. lack of rain) will recede into the soil, essentially becoming invisible. Therefore, we will continue to search for additional occurrences of Arizona endemics using our newly created models (prediction maps).

Photo 5: Brady pincushion cactus, *Pediocactus bradyi*.
Photo by Daniela Roth.

How and Why...?

How did these plants come to occur in Arizona and nowhere else? Why haven't they spread to areas beyond the state? These are two of the most commonly asked questions when Garden researchers share this work. If you think about islands, like the Hawaiian Islands, it is somewhat easy to imagine how and why there would be many endemic plants and animals there. The islands are isolated, far from any other land. The ancestors of today's species evolved in isolation and then had very little chance of dispersing anywhere else. But, in a place like Arizona, what could be the explanation?

In truth, there is no single answer. In a few cases, the explanation is rooted in fairly recent events that eliminated the plants from nearby states, such as the disappearance of Maguire's penstemon from New Mexico, owing to mining activities. But for most of the plants, the answers lie in much deeper time. Some species may be what are known as paleoendemics, representatives of a once much more widespread species that for any number of reasons, including climate, geologic changes, and so on, have become restricted to a much smaller area. Other species may be neoendemics, fairly recently developed species that have not been in existence long enough to spread widely. These are possibilities and explanations that Garden researchers will explore in the future.

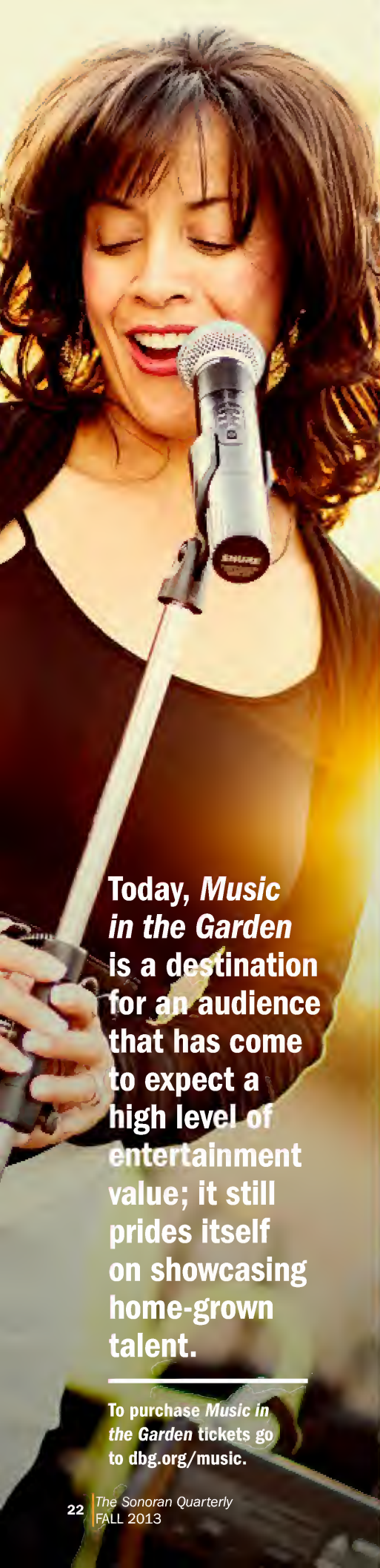
The more we can understand about the factors that shaped the biological world we live in now, the better we can predict what the biological world of the future may look like.

Special Plants—Special Place

One hundred sixty-seven kinds of plants representing 30 different plant families. Plants with showy flowers, and tiny flowers, plants that grow many feet tall, and plants that grow only a few inches high, plants of the desert, plants of the mountains, plants of the canyons, plants of the grasslands, plants of the stream ways, all with one thing in common...they all are found only in Arizona.

Photos top right, middle and bottom: Photo 6 - Kaibab Plateau Indian paintbrush, *Castilleja kaibabensis*. Photo ©Mark Egger, SEINet. Photo 7 - Canelo Hills ladies' tresses, *Spiranthes delitescens*. Photo by Jim Rorabaugh, U.S. Fish & Wildlife Service Arizona Ecological Services Field Office. Photo 8 - *Agave utahensis* ssp. *kaibabensis*-rose. Photo by Wendy Hodgson.





Today, *Music in the Garden* is a destination for an audience that has come to expect a high level of entertainment value; it still prides itself on showcasing home-grown talent.

To purchase *Music in the Garden* tickets go to dbg.org/music.

Music and the Garden are a Natural Fit

by Pam Hait and Martha Hunter, Strateg!es, a marketing and public relations firm

In preparation for writing this article, we asked Executive Director Ken Schutz if he had any thoughts about why the *Music in the Garden* program had enjoyed such resounding success.

“Why is *Music in the Garden* such a natural? Maybe it’s because music, like our garden, is organic. Music and our desert garden even share a language. We speak about the roots of music to describe its history; color to describe its vibrancy. And we talk about voice to describe the sounds of both,” he suggested.

The roots of *Music in the Garden* are found in a proposal by Kate Ellison, Ann Gully and their committee of volunteers, who planned and organized a music series in the fall of 1988. Concerts were held every other Sunday and featured a full range of music, from classical to folk. Local groups were headlined. The committee had a tight budget, so they bought the tablecloths they needed, took them home every week to wash and iron, and brought them back in time for the next concert. Volunteers were essential. Jon Shomer provided technical expertise and helped on the sound system, while Marilyn Shomer welcomed people and handed out programs.

For many years, until Ullman Terrace was built, events were held throughout the Garden. According to Kate Ellison, a new age musician they hired for a concert, held at the Succulent House, showed up wearing a pith helmet—he fit right in.

The original expectation was that people would drop in on a Sunday, relax with their newspapers, and enjoy the Garden and the music. The Garden, in exchange, would gain exposure. The caterer, however,



never knew who or how many people would show up since the crowd ranged from fifteen to fifty.

The first blockbuster was a Mother’s Day brunch in the early 1990s that drew an enormous crowd, so large that Director Dr. Robert Breunig was seen bussing tables. At least one musician, jazz guitarist and vocalist Pete Pancrazi, has played concerts at the Garden every year since 1996.

“The draw is the magnificent scenery,” he explained. “The venue is beautiful, with its view of the Papago Buttes. It doesn’t take long to realize that this is a special place.”

Today, *Music in the Garden* is a destination for an audience that has come to expect a high level of entertainment value; it still prides itself on showcasing home-grown talent. The series features seven concerts in the fall, with 18 concerts in the spring. Last fall, the series was completely sold out—and Ullman Terrace accommodates 420 people. During one of those fall concerts, the evening skies opened, bringing torrential rain. The second half of the concert was hastily moved to Webster Auditorium where the musicians played acoustically. The closing number was “Amazing Grace.” The audience spontaneously sang along, a testament to the magic of the Garden, especially in the rain.

One can’t help but wonder how Gertrude Webster would view these concerts in her beloved Garden. Above all, she wanted people to enjoy its beauty and grace. No doubt, however, she would have served gin and tonics and offered a cigar bar!

garden news

National Science Foundation Grant Awarded

Shannon Fehlberg (Dorrance Family Foundation Conservation Biologist, Desert Botanical Garden), **Carolyn Ferguson** (Kansas State University), and **Alan Prather** (Michigan State University) were recently awarded a collaborative, three year grant from the National Science Foundation totaling \$774,000 (Fehlberg \$217,000, Ferguson \$346,000, Prather \$211,000).

The study will focus on diversity in three *Phlox* species groups in the southwestern United States and examine ways in which populations and species differ from one another. Researchers will look at fine-scale patterns of genetic and morphological diversity and evolutionary history, and interpret those patterns in light of ecology, geography, and polyploidy. The information gained from this research will provide insights into the fundamental processes that generate diversity in plants and will serve as a model for similar studies of plant evolution.

Outreach activities are planned as part of the project, including the development of an educational module that will be implemented in local high schools, a workshop for Garden docents and volunteers, and training of undergraduate, graduate, and postdoctoral scholars.

SHARE your FAVORITE LUMINARIA MEMORIES

As we continue to celebrate the Garden's 75th anniversary, we invite you to send us your *Luminaria* memories and photos. Please email them to memories@dbg.org or send them to Garden Memories, c/o Desert Botanical Garden, 1210 N. Galvin Parkway, Phoenix, AZ 85008. We will have them displayed in Ottosen Gallery during the evenings of *Luminaria*. You can also bring your photos on the night you plan to experience *Luminaria* and post them on the displays.

Valley Metro Bus Connects Garden with Light Rail

Now there is a greener way to get to the Garden. In June 2013, the Phoenix City Council unanimously voted to add the Desert Botanical Garden as a direct stop for Valley Metro Bus riders. The Route 56 Priest Drive bus made its maiden trip on July 22 with passengers from points south including the Valley Metro Rail station at Priest and Washington.

The Garden bus stop is located in the parking lot at the north end of the walkway to the Schilling Entry Arbor. The bus is scheduled to arrive every 30 minutes, Monday through Friday from 5:50 a.m. to 7:41 p.m. The schedule for weekend busses is different so plan ahead. You can purchase fare passes at Valley Metro Rail Stations, Circle K, Fry's and other locations valley-wide. For more information visit valleymetro.org.



Please note: Submitted Garden memories, whether written words or image, become the property of Desert Botanical Garden. The Garden reserves the right to use or not use the submitted memories or edit them for clarity. The right to use the Garden memories is not limited to activities surrounding the 75th Anniversary Celebration.

Photo Credits

Page 2 Ken Schutz - Jim Poulin

Page 2 Saguaro - Adam Rodriguez

Page 3 Desert Botanical Garden historical photos courtesy of the Schilling Library Archives

Page 8 Exhibit planning teams - courtesy of Desert Botanical Garden

Page 10 Top photo: Garden scene - Adam Rodriguez

Page 10

Left to right: Saguaro - Charlie Cobeen, Seedling preschooler in Butterfly Exhibit - Courtesy of Desert Botanical Garden, *Echinopsis* hybrid - Adam Rodriguez, Conservation Alliance activity, North Mountain - Stacie Beute

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Sonoran Desert Nature Trail - Adam Rodriguez, Saguaro - Adam Rodriguez

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Garden scene - Adam Rodriguez

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Canal Water Project photos - Chris McCabe

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Chele - Leland Gebhardt Photography

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Traveler at Garden concert - Adam Rodriguez

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Fire pit at Luminaria - Adam Rodriguez

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Echinopsis huascha - Adam Rodriguez

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Dinner on the Desert photos - Darrylee Cohen, Haute Photography

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Ferocactus latispinus - Adam Rodriguez

Back cover:

Outdoor venue, Plant Sale, The Great Pumpkin Festival and *Día de los Muertos* - Adam Rodriguez

in appreciation

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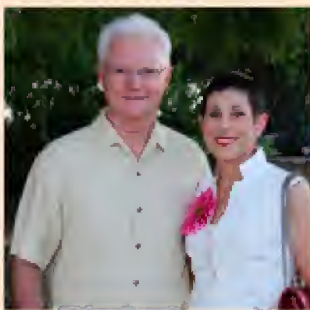


in appreciation



Dinner on the Desert

On April 27, 2013, the Desert Botanical Garden hosted 624 guests at the 27th Annual Dinner on the Desert, the Garden's major annual fundraiser. Co-chaired by Jan and Tom Lewis, the event theme, *A Garden for all Seasons*, honored the Garden's timeless beauty while celebrating its 75th Anniversary year.



Tom & Jan Lewis.

The evening began with guests arriving at *Ottosen Entry Garden* with warm welcomes, a signature cocktail, and Domingo DeGrazia playing Spanish guitar. Guests enjoyed the setting sun as they took in the grandeur of the Garden and strolled to Dorrance Hall for the silent auction and the chance to bid on more than 330 striking specimen plants, exceptional pots, and inspired garden art, plus unusual and exciting experiences. The Super Silent Showcase featured exciting one-of-a-kind experiences and items including trips, a Jim Sudal

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agave mural, sculptures, and unique dinners. The most popular raffle prize was \$1,000 cash.

The magical setting of the Stardust Foundation Plaza, enlivened by the exuberant sculptures of *Phillip Haas: The Four Seasons*, and Boppart Courtyard, with music by Strings Serenade, served as the background for an evening of inspired cuisine prepared by Chef Dominic Vaccaro of Copper Square Kitchen/Hyatt Regency Phoenix.

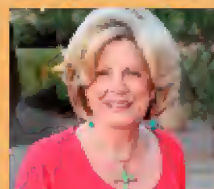
After dinner, rock violinist Geoffrey Castle electrified guests back in *Ottosen Entry Garden* for a nightcap and parting gifts of Desert Botanical Garden 75th Anniversary private label wine bottles, event-inspired note cards, and gourmet cookies. A new record was set, with net revenue of \$473,000 raised to benefit educational and community programs.

DINNER ON THE DESERT 2013 Table Hosts, Underwriters, Sponsors & Reservations

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Save the Date

Plans are underway for a beautiful and spectacular Dinner on the Desert 2014 with event chair, Martha Hunter. Please mark your calendars for April 26, 2014 and be sure to join us for next year's Dinner on the Desert.



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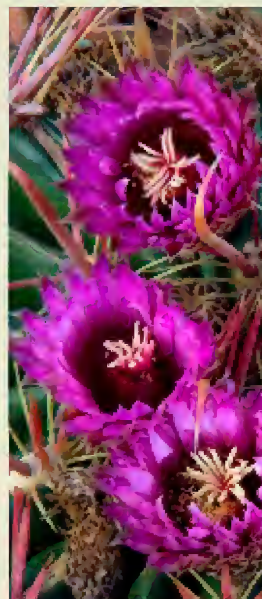
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The Desert Botanical Garden Mission

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



WiFi Zone

FREE WI-FI is available in five locations within the Desert Botanical Garden: the area in front of Admissions, Ottosen Entry Garden, Boppert Courtyard, the Center for Desert Living Trail, and Ullman Terrace.



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PHOENIX OFFICE OF ARTS AND CULTURE

Partial funding provided by the Phoenix Office of Arts and Culture through appropriations from the Phoenix City Council.

NEW OUTDOOR EVENT VENUE AT THE GARDEN! New Place! New Dates! New Times!

Last spring, the Garden completed construction of an outdoor event plaza that was part of the expanded parking project. Look for our fall lineup of events to be held in this new venue, including the annual Fall Plant Sale, the four-day Pumpkin Festival, and the award-winning *Día de los Muertos* Celebration! Visit dbg.org for dates and times of events.



Fall Plant Sale

October 11 - 13

Garden Members Preview:

Friday / October 11

7 a.m. - 5 p.m.

Open to the General Public:

Saturday / October 12

7 a.m. - 5 p.m. AND

Sunday / October 13

9 a.m. - 5 p.m.



The Great Pumpkin Festival

October 17 - 20

Thursday and Friday

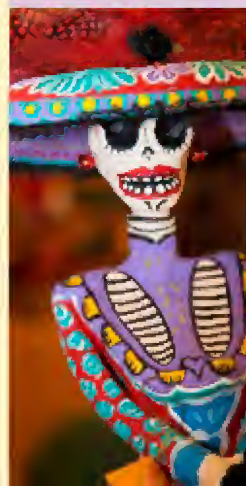
8:30 a.m. - 12 p.m.

Saturday and

Sunday / October 19

and October 20

8:30 a.m. - 3 p.m.



Día de los Muertos

November 2 - 3

Saturday and Sunday

10 a.m. - 5 p.m.

La Procepción

November 3

Sunday / 5 p.m.

SONORAN QUARTERLY

FOR MEMBERS AND FRIENDS OF THE DESERT BOTANICAL GARDEN

PHOENIX, ARIZONA DECEMBER 2013, VOLUME 67, NO. 4



1939 2014
DESERT
BOTANICAL
garden

A Great Place to Work



Each workday I put on my **Desert Botanical Garden name badge with great pride.** Having been the Garden's director for more than 12 years, I proudly wear my five-year and 10-year service pins, and look forward to receiving my 15-year service pin in June 2016. I also wear my Sonoran Circle pin on my name badge each day, indicating that I have provided for the Garden's future in my estate plans.

Last year, the Desert Botanical Garden was recognized as being in the top 25 best places to work.



While it may seem immodest to say so, I think the Desert Botanical Garden is a great place to work! Here are two examples that help explain why I feel that way.

The first is recognition given annually by the *Phoenix Business Journal*, which conducts a survey of many different employers in the Valley that are nominated for designation as "one of the best places to work." The assessment conducted by the paper is rigorous, and includes an online, confidential survey of at least 58 employees for each nominated organization. Last year, the Desert Botanical Garden was recognized as being in the top 25 best places to work in the Medium Sized Category.



The second example that speaks to the Garden being a great place to work involves an employee, Wendy Hodgson, who will celebrate her 40th anniversary at the Garden this January. This issue features Wendy's story and celebrates her success as a Desert Botanical Garden researcher. Can there be any greater testament to the notion that the Garden is a great place to work? I don't think so, and I know you will enjoy reading about Wendy's incredible career, which is still going strong!

Ken Schutz
The Dr. William Huizingh Executive Director

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In Appreciation

On the Cover

Dale Chihuly

Polyvitro Chandelier and Tower, 2006
Desert Botanical Garden, Phoenix, AZ,
installed 2013
Photo by Adam Rodriguez

Back Cover

BRING THE WHOLE FAMILY TO
LAS NOCHES DE LAS LUMINARIAS.
November 29 - December 31.
TICKETS ON SALE for *CHIHULY IN THE GARDEN*.
Now through May 18, 2014.

PLANT ATLAS PROJECT of ARIZONA

Connecting People with *Plants*

by Wendy C. Hodgson, Herbarium Curator and Research Botanist, and Kate Watters, the Grand Canyon Trust

Several years ago at the Arizona Botany Meeting hosted by the Garden, Hodgson listened to Dr. Jon Rebman (Curator of Botany, San Diego Natural History Museum) describe a program he developed that trains volunteers in all aspects of field botany – collecting, identifying, and data-basing their collections from specific areas in San Diego County. What a great way to involve anyone, regardless of expertise, to assist botanists in contributing towards floristic work (inventories of plants) in particular areas that are in need of study!

Hodgson thought, “We need to do this in Arizona.” Further conversations with colleagues from the Grand Canyon Trust and the U.S. Forest Service were met with excitement. The Grand Canyon Trust (a nationally recognized nonprofit conservation organization that advocates research and education about the natural resources of the Colorado Plateau) and the Garden developed a botanical “budding botanist” boot camp with several other partners and collaborators. The Plant Atlas Project of Arizona (PAPAZ) was born.

A Project with Many Partners

PAPAZ was officially formed in 2008 as a partnership between the Desert Botanical Garden, the Grand Canyon Trust, Arizona Native Plant Society, Museum of Northern Arizona, Northern Arizona University, and the U.S. Forest Service. Today, the program also involves the Bureau of Land Management and herbaria at the University of Arizona, Arizona State University, and Brigham Young University. PAPAZ is so successful that the Trust’s Utah Forest Program uses it to train volunteers including the “Great Old Broads for Wilderness” (a national organization of older women protecting wild lands), in providing plant data that will be used to protect and restore native plant communities on public lands in southern Utah.

PAPAZ volunteers participate in an annual weekend boot camp-style training, learning plant identification, collection and processing skills through field and classroom trainings led



Garden researchers Matt King, Wendy Hodgson, Steve Blackwell (far right) and the Grand Canyon Trust’s Stephanie Smith, Paria Plateau in the rain. Photo by David Mowry.

by us and other regional botanists. As a result, they bring high-level technical skills to assist with not only floristic projects, but projects documenting baseline conditions of rare and invasive species at several critical springs, seeps and habitats throughout Arizona. More than 135 volunteers have donated 4,700 hours of their time collecting, identifying, and processing more than 3,600 specimens for regional herbaria, including the Garden. Volunteers have also entered the accumulated data into the web-based Southwest Environmental Information Network (SEINet), which is a database of more than two million specimens primarily from the Southwest, deposited in 60 herbaria. SEINet provides specimen data, distribution maps and images, and species descriptions to anyone who has access to the Internet.

Why do we need PAPAZ?

We are fortunate to live in Arizona, with its impressive array of more than 4,200 species of plants, an astounding number that is surpassed only by California and Texas. Such diversity reflects the state’s myriad of habitats, diverse landforms and elevations, and corresponding temperature and rainfall regimes where five major deserts interface with adjacent arid regions. The number of recognized species continues to grow, too, as new discoveries for the state are found and new species described. Over the last 60 years, approximately 12 species new to Arizona have been reported annually and in the last 10 years at least 12 species new to *science* have been discovered in Arizona (descriptions for half of these species were based on specimens housed in the Garden’s herbarium). In fact, the pace of new species description is expected to increase as new techniques like DNA bar-coding are added to the plant taxonomic tool box. Our state also has approximately 170 plant species found nowhere else in the world.

Adding to the great need for the information that PAPAZ provides, Arizona’s land management and ownership is diverse, with 41 percent federally managed by entities such as the U.S. Forest Service, Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, Army



The Arizona rare and endemic *Sclerocactus sileri*, Paria Plateau, Vermilion Cliffs National Monument. Photo by Wendy Hodgson.

Corps of Engineers, U.S. Armed Forces and Bureau of Indian Affairs. The best land management practices rely on knowing what occurs where for plants. Floristic studies are the means to provide such information. Floras tell us what species exist in a given area, which ones are in danger of being lost locally or globally, and which species are invading. Floras are constantly changing, but until we have a baseline study we cannot see the change.

World-renowned systematist and biologist E. O. Wilson remarked that “Phylogenetic reconstruction, currently the dominating focus of systematics, obviously is worth doing, but more scientifically important and far more urgent for human welfare is the description and mapping of the world biota.” Jim Miller, Dean and President for Science at the New York Botanical Garden, stated that “There is urgency in describing the plants of the world. I don’t think we have any capacity to understand and take care of nature unless we can identify it.” Lack of funding for field research and less training for future field botanists, often because of a lack of understanding of the significance of floristic studies, has hampered our understanding of what and where species occur worldwide, including Arizona. The importance of citizen

involvement is now greater than ever, which is why PAPAZ was formed.

Ambitious PAPAZ Covers Many Areas

The program’s budding botanists and coordinating botanists have focused mainly on northern Arizona but have recently expanded into the central and southern parts of our state. In August, the first PAPAZ botany boot camp was successfully held at the University of Arizona, where 22 newly trained and eager budding botanists fledged into the southern Arizona botanical world. Areas in northern and central Arizona include 1) Hart Prairie Preserve near the San Francisco Peaks, 2) Verde Valley Botanical Area near Cottonwood, 3) Tent Rocks/Cottonwood Basin near Camp Verde, 4) Upper Basin just south of Grand Canyon, 5) Grapevine Canyon near Prescott, 6) Truxton-Hackberry near Peach Springs, 7) Upper Verde River, 8) Fossil Creek east of Camp Verde, 9) Kane and Two Mile Ranches and allotments, including Kanab Creek, springs of House Rock Valley and North Rim, Paria Canyon, and Vermilion Cliffs National Monument, and 10) North Mountain Preserve, Phoenix (see side bar page 7 about the Conservation Alliance).



Budding botanist boot camp training in at University of Arizona herbarium, Tucson, August 2013. Photo by Ries Lindley.



At the edge of Vermilion Cliffs, looking down on Marble Canyon and Echo Cliffs. Photo by Wendy Hodgson.

Southern Arizona PAPAZ flora projects include 1) Tortolita Mountains north of Tucson, 2) Dagoon Mountains southeast of Tucson, 3) Salero Ranch near Tubac, 4) a portion of the Santa Rita Mountains, and 5) Bear Canyon Wash in northeast Tucson. Three floras (Upper Verde River, Upper Basin, and Vermilion Cliffs) are projects for students' Masters Theses. The Garden's commitment to PAPAZ includes involvement in the floristic inventories for Fossil Creek, North Mountain Preserve, and Kane and Two Mile Ranches. The latter two are funded by grants provided by the Nina Mason Pulliam Charitable Trust, Friends of the Cliffs, National Landscape Conservation System, and Native Plant Conservation Initiative from the National Fish and Wildlife Foundation and the U.S. Forest Service, respectively.

Budding Botanists Create Baseline Data

Collection efforts in Fossil Creek are focused on the Fossil Creek Planning Area and includes the 10,000 plus acre Fossil Springs Wilderness and the 50 acre Botanical Area, both situated just south of the Mogollon Rim.

The Planning Area consists of both riparian and upland vegetation. Fossil Creek Botanical Area was given "special management area" status by the U.S. Forest Service due to its unique natural value, including its many springs and intact riparian forest. The perennial water there supports one of the most diverse riparian ecosystems in Arizona. Specimen-based baseline data provided by budding botanists under the direction

of Joni Ward and Hodgson will assist management efforts of an area where visitation by the public has increased greatly over the past few years, and where exotic (i.e. invasive) species have taken a significant foothold.

The Kane and Two Mile Ranches were purchased by the Grand Canyon Trust with the help of the Conservation Fund in 2005. These ranches and their accompanying grazing leases and allotments encompass a huge area on the Colorado Plateau, spanning from Marble and Paria canyons west to Kaibab Plateau and Kanab Canyon, and north to Vermilion Cliffs and Paria Plateau. The Bureau of Land Management and the U.S. Forest Service are interested in protecting the ecological and cultural resources across this great expanse (Watters 2012). With the creation of PAPAZ, the Grand Canyon Trust and the Garden began botanical inventories in this vast region, building upon earlier collecting efforts by Hodgson and others. Areas of focus include the vertical Navajo Sandstone-dominated Paria Plateau within Vermilion Cliffs National Monument.

Few botanists have ever visited these remote areas. An initial survey in 2008 by the Trust and Garden added 64 species to the list of approximately 475 that were previously known in Vermilion Cliffs National Monument and Paria Canyon. As of today, through the efforts of PAPAZ, more than 700 species have been documented! This area is home to a diverse assemblage of habitats, flora and fauna, including several rare



species and those endemic to Arizona. A large number of springs important to not only plants and wildlife, but also to early native peoples, and later Mormon settlers are found throughout much of this area.

How do we protect these diverse habitats? We must better understand them, and there is no better time to do so than now. Visitation to Vermilion Cliffs National Monument, for example, including such recreational uses as off-road vehicles, has more than doubled between 2000 (when the Monument was designated) and 2007 (Watters 2012). These and other factors like invasive species, grazing, and climate change can, do, and will affect these plant communities now and in the future. As with many other areas, baseline data documenting what and where plants grow within Vermilion Cliffs National Monument is needed. This important work is being supported by a grant to the Grand Canyon Trust, the Garden, and Brigham Young University. All of the data will be made available through SEINet.



Budding botanists collecting plants in the North Mountain Preserve.



Budding botanists pressing plants collected in the North Mountain Preserve. Both photos by Wendy Hodgson.



Caring Leads to Action on North Mountain

For conservationists a first question is, “Conserve what?” Simply put, we cannot conserve or manage for what we don’t know exists.

This maxim applies not just globally, but in our own backyards—in the Valley’s mountain preserve system. Many of the mountain preserves, like North Mountain, have never had the entirety of their flora formally documented. Through the Conservation Alliance initiative, Desert Botanical Garden has taken the lead in filling this information gap through the North Mountain Plant Inventory Project (NMPiP), part of the greater Plant Atlas Project of Arizona endeavor.

“You have to know what is out there, and the Garden has trained, mentored, and guided dedicated citizen scientists, using best practices, to identify and inventory the flora of a rapidly disappearing ecosystem,” said Dawn Goldman, lead budding botanist.

More than twenty citizen botanists participate in the North Mountain Plant Inventory Project. They take part for many reasons, which include personal nostalgia for the wildflower season that once was, to more scientific interest in the plants, to concern for the “changing mountain.”

“When asked, the ‘old-timers’ tell us the North Mountain Preserve looks much different than it did forty years ago, but they can’t say exactly how it is different. If someone asks that question forty years from now, thanks to the Plant Inventory, they will receive an exact and comprehensive answer as to how it is different,” said Cheryl and Bob Toloskiewich, budding botanists.

Thanks to nearly 1,000 hours of hard work and commitment, NMPiP participants are beginning to answer questions about the flora of North Mountain. Project volunteers have documented more than 137 species and subspecies of plants in the preserve, including some natives rarely documented within city limits. Through the Garden’s leadership in regional conservation and the commitment of NMPiP participants, we now know that at North Mountain there is much to be conserved.

The Conservation Alliance is a component of regional leadership for the Garden’s *Saguaro Initiative* and is generously supported by the Nina Mason Pulliam Charitable Trust.



Happy budding botanists led by Joni Ward botanizing in Fossil Creek. Photo by Chris Boren.



Stunning White Pockets, Vermilion Cliffs National Monument. Photo by Wendy Hodgson.

Being knowledgeable about natural resources increases appreciation for them, and with appreciation comes better stewardship.

What does PAPAZ provide?

The collective documentation efforts of PAPAZ coordinators and volunteers have greatly improved our knowledge of plant diversity and distribution, particularly in northern Arizona. Its activities 1) build a constituency of knowledgeable land stewards and conservation advocates, 2) create opportunities for people to learn about the native flora from regional experts, 3) promote ongoing education and careers in botany and plant conservation, and 4) provide participants with a sense and knowledge of contributing towards a greater cause, while also just plain having fun!

Being knowledgeable about natural resources increases appreciation for them, and with appreciation comes better stewardship. In addition, a more informed public makes better decisions at the voting booths with regards to our public lands – lands whose care is entrusted to their respective land management agencies. PAPAZ provides a win-win situation for volunteers, land management agencies, the public and of course, plants, wildlife and their habitats.

Today, the importance and role of nonprofit institutions such as the Desert Botanical Garden in research and biodiversity conservation are greater than ever. Botanical gardens provide botanical education and training, utilizing their herbaria and living collections to contribute toward a larger, global conservation strategy (Kramer et al. 2010). They develop programs and workshops to train aspiring and future taxonomists/systematists, curators and field botanists, while continuing to care for and build their systematic collections. PAPAZ is one such important way



Budding botanist collecting and pressing plants at White Pockets, Vermilion Cliffs National Monument. Photo by Wendy Hodgson.

to attain these goals. The Desert Botanical Garden, with its well-established research, education and volunteer programs, will be a catalyst to take this program to even greater heights.

For more information about PAPA Z, visit the Grand Canyon Trust website www.gcvolunteers.org/trainings.html or for a quick fact sheet, visit www.gcvolunteers.org/documents/PAPAZFAQ.pdf.

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How a Golfer became a Research Botanist

by Dawn Goldman, research volunteer and Kimberlie McCue, Ph.D., Program Director, Conservation of Threatened Species and Habitats

The few clothes she brought are wrapped around newly collected agaves, yuccas, and cacti, her backpack far heavier than when she began her trip. This is Wendy Hodgson at the end of another collecting expedition. But this is not the end of her journey, nor is it the beginning.

Wendy's story begins in 1969, when she arrived in Tempe to attend Arizona State University on a golf scholarship. Being from New York, the only agaves she was familiar with in those days were those scattered along golf club fairways. As fate would have it, one class, "The Flora of Arizona," changed both Wendy's life and the Desert Botanical Garden's research fortunes.

Wendy began her Garden career on January 22, 1974 as an art illustrator and researcher for Dr. Howard Scott Gentry, working on his manuscripts, *Agaves of Baja California* and *Agaves of Continental North America*. It is during this time that Wendy's love affair with agaves took root.

As the Garden grew, so did Wendy's experience, skills, and passion. In 1984, she became curator of the herbarium and a research botanist. In the decades to follow, her contributions to both the Living and Herbarium Collections mounted as Wendy explored Arizona and beyond. Always with her plant press. Always with her collection book.

Wendy's achievements are many. Her book, *Food Plants of the Sonoran Desert*, won the 2002 Klinger Book Award from the Society for Economic Botany. She has discovered five new agave species and a new species of *Mentzelia*. Wendy is a recognized authority on rare plants and is arguably the world's expert on the flora of the Grand Canyon. Hers has been a journey of hard work, devotion, and a tremendous love of plants.

Thank you, Wendy, for your dedicated 40 years of service. You have truly made a significant difference!

75
YEARS
and growing

DID YOU KNOW

The Garden's herbarium will become one of the first virtual herbaria in the country with support from a grant from the National Science Foundation.

A Successful Second Year for the Community Garden Project

by Kenny Zelov, Assistant Director of Horticulture

***"To forget how to dig the earth and to tend the soil is to forget ourselves."
- Mahatma Gandhi***

The second year of the community gardening program, funded by a generous grant from The Steele Foundation, has built on the foundation laid the previous year (see *The Sonoran Quarterly* Vol. 66, No. 4, 2012, p. 8-9 or available at dbg.org/sqonline). This year the focus has been growing the garden and nurturing the gardener community. At the conclusion of the project in May 2014, we will use what we have learned to develop a comprehensive plan for community partnerships, possible satellite gardens, and an onsite gardening resource center.

During the past year, 18 individual and six communal plots, representing more than 50 gardeners, were planted and maintained. Educational sessions were also designed and delivered at the garden site to help support the experience of our community gardening environment. Gardeners enjoyed many successes and dealt with challenges during that time, including extreme frost and summer heat, broken water lines, and critters infiltrating the perimeter fencing. All of these experiences were typical learning opportunities in which the gardeners worked together to help each other grow.

Community garden volunteers have successfully created a website where they can post educational documents, veggie photos and garden announcements and share their experiences with one another. While they reaped the fruits of their labor, they also learned what did and did not work for fellow gardeners. These valuable lessons will serve us well as we document these best practices for the next phase of this project. Jack Gilcrest, one participant in the program commented, "We have enjoyed getting to know each other, learning how to work together, increasing our urban farming knowledge and skills and last, but not least, enjoying our harvests. We had such a good time



that we are looking forward to another year of gardening together and to an even greater bounty of edibles from our gardens!"

One aspect that makes this project unique is the composition of the team. Most community gardens are located in the gardeners' neighborhood, or they convene to volunteer at a garden to grow food for a food bank or similar organization. For this program, however, the community garden was undertaken in addition to their responsibilities as Garden employees and volunteers, creating a truly close-knit gardener community.

We have realized that the community garden would benefit from the leadership of a central coordinator in a staff position, who could direct the community garden's activities. To address this issue, we hope to add a program coordinator who will oversee the operations of this test garden while also helping to develop and implement the Desert Botanical Garden's role in the overall community garden movement.

The Garden has committed to the continuation and expansion of this project into the community by incorporating it into *The Saguaro Initiative*, which will provide \$18 million for a series of new Garden programs, exhibits and endowment. In addition to investing in the Garden as a leader in exhibition, education, research and conservation, *The Saguaro Initiative* will establish the Garden's role in the local community garden movement.





DIVINE Dining

Whether it's a quick breakfast, a meal later in the day, or Sunday brunch, diners agree that the food at Gertrude's restaurant is delicious and the setting is divine.

Gertrude's, the Garden's full-service restaurant, located just inside the main entrance, honors Garden founder Gertrude Divine Webster. Originally used as a greenhouse, it occupies the fully renovated space that previously held the plant shop.

Gertrude's modern American cuisine is under the direction of Chef Stephen Eldridge, a self-professed locavore, who fervently supports the local food movement. For Eldridge, the focus is simple: "Eating local is healthy for the body and mind and it also positively impacts the environment and economy." He believes the best ingredients are the ones that are grown, raised, or made with the objective of providing natural, wholesome, and sustainable products. In addition to obtaining food items from local artisans and farmers, the restaurant grows vegetables and herbs onsite in the Garden's Community Garden. This winter, diners will notice a variety of Garden-grown produce on their plates, including lettuces, black kale, beets, carrots and radishes accented by basil, mint, rosemary, tarragon, and lavender.

"Our goal is to bring a new perspective on ingredients, cooking technique, presentation, and guest experience by preparing and presenting food with integrity in an uncomplicated straightforward manner," explains Eldridge. "You can see and taste what I'm talking about when you dine at Gertrude's." The bustling culinary team prepares nearly everything in-house, cooking dishes from scratch, and utilizing multiple techniques like fermenting, curing, and smoking to eliminate the need for preservatives.



Rave reviews from an ever-growing list of food writers and magazines, including restaurant critic Howard Seftel who has remarked on Eldridge's culinary imagination, are drawing curious and hungry diners to the Garden.

Gertrude's regularly receives accolades for innovative dishes like the signature Brussels + Breakfast, the "Lambcetta" house cured pancetta-style lamb, and the Swine, which combines grilled pork loin, smoked pork, house sausage and cassoulet. The all day menu also features Niman Ranch burgers, the 3 Napkin Smoked Swine, Sonoran Dog, Garden Beet Salad and Smothered Kennebec Fries. Pastry Chef Marisa Lown brings a creative touch and expert hand to sweets guaranteed to satisfy. Her Ricotta Donut Holes accompanied by a trio of sauces and the gluten-free Citrus Berry Cheesecake are particularly tempting.

Gertrude's full bar menu features Arizona craft beers on tap and an affordable range of distinctive wines by the glass and bottle. Noteworthy spirits made with native Arizona ingredients and Garden-grown herbs include Garden-inspired cocktails such as The Gertrude Divine, Fig Manhattan and House-Craft Red or White Sangria.

Gertrude's offers indoor and patio dining, a private chef's room for 12, and an expansive bar. Reservations for lunch and dinner are suggested and can be made on Open Table (opentable.com) or by calling Gertrude's at 480 719.8600. Winter hours are Monday - Sunday from 7 a.m. - 9 p.m. Sunday brunch is served from 9 a.m. - 2 p.m. gertrudesrestaurant.net, at [facebook.com/gertrudesrestaurant](https://www.facebook.com/gertrudesrestaurant) or @gertrudesdbg.

A N N I V E R S A R Y C E L E B R A T I O N



DESERT
BOTANICAL
garden

H I G H L I G H T S

CELEBRATE

It's a
Garden Party!

On Saturday, September 28 and Sunday, September 29, 2013, the Garden invited the community to help celebrate our 75th anniversary with free admission to both the Garden and *Mariposa Monarca* Butterfly Exhibit.

Visitors enjoyed an array of activities, including live music and face painting on Boppart Courtyard, behind-the-scenes tours of Garden greenhouses and herbarium, and planting presentations on the *Center for Desert Living Trail*.

Upon departure, each visitor received a *seed bomb* containing a unique variety of Sonoran Desert wildflowers to bring the beauty of the Garden to their own homes.

Garden Members were treated to cupcakes and refreshments in Webster Auditorium. Pictured above are 10-plus year members including Garden staff who joined us to celebrate our 75 years.



10-plus year members.



Visitors inspired by *Center for Desert Living Trail*.



Dr. Kimberlie McCue (right) leading tours in the Conservation Greenhouse.



Kids activities on Boppart Courtyard.



Guests on Stardust Foundation Plaza.

CHIHULY | IN THE GARDEN

Opening Night Gala and Preview
Friday, November 8, 2013



Fairies, courtesy of the Southwest Shakespeare Company.

Thank you to Lee and Mike Cohn, Co-Chairs, the fabulous Gala Committee and all our generous table hosts, underwriters and supporters.

**Proceeds from the event benefit
*The Saguaro Initiative!***



Lee and Mike Cohn.

Reaching the Goal

Gifts confirmed as of
November 18, 2013

\$18 million

\$16 million

\$14 million

\$12 million

\$10 million

\$8 million

\$6 million

\$5.6 million

\$4 million

\$2 million

The Saguaro Initiative:

In the September issue of his *Desert Journal* column, Ken Schutz wrote about the ambitious plan to invest \$18 million in new exhibits, state-of-the-art greenhouses and innovative community wide projects. We are pleased to report that as of November 18, 2013, \$5.6M has already been contributed or pledged to support these initiatives. For more information, please visit <http://saguaroinitiative.dbg.org>.

CHIHULY | IN THE GARDEN

TRANSCENDING *the* VISITOR EXPERIENCE



by Elaine McGinn,
Director of
Planning and
Exhibits

Top Right:
Dale Chihuly
Sapphire Star, 2010
9½ x 9½ x 9½'
Desert Botanical Garden,
Phoenix, installed 2013

Top Left:
Dale Chihuly
Summer Sun, 2010
15 x 14 x 14'
Desert Botanical Garden,
Phoenix, installed 2013

Dale Chihuly, one of the most successful artists ever to have displayed in botanical gardens around the world, made a return engagement to the Desert Botanical Garden this fall.

Chihuly's stunning works of art, immediately recognizable by their grand scale and use of vibrant colors, are once again nestled amongst our desert landscape. *Chihuly in the Garden*, which opened November 9 to our members, showcases 21 installations throughout the Garden and is expected to be a popular destination throughout our winter and spring seasons.

Born in 1941 and raised in Tacoma, Washington, Dale Chihuly studied interior design and architecture at the University of Washington in Seattle. As a Fulbright Scholar, he spent time at the Venini glass factory in Venice, Italy. There he learned the art of glass blowing from masters

known for their exquisite creations who had centuries of combined knowledge and experience. Chihuly's artwork is included in more than 200 museum and botanical garden collections worldwide, including the Metropolitan Museum of Art, and the Smithsonian American Art Museum.

Chihuly's unorthodox approach of using a team of glassblowers allows him to work on a grand scale and to experiment with design and form. The results of his extraordinary vision elicit widespread admiration from all who view his sculptures, which range from single vessels to indoor and outdoor site-specific installations that exemplify his fascination with color, light, and nature.

Chihuly in the Garden is an enchanting visitor experience. The artist has once again juxtaposed his glass forms with those of nature, blurring the boundaries and establishing a direct and



JPMorgan Chase is so proud to support the Chihuly partnership with the Desert Botanical Garden. The creativity of Chihuly's work inspires the deeper understanding of the importance of preserving the natural environment and the power of its ability to inspire innovation.

— Cree Zischke, Vice President of Community Relations for JPMorgan Chase

immediate dialog between nature and art. The magical effect of the artwork interspersed among our incredible collection of desert plants leads visitors to a new way of seeing both.

The *Chihuly in the Garden* exhibition includes the *Sapphire Star* in Ottosen Entry Garden; a *Polyvitro Chandelier and Tower* hanging from the vaulted roof of the *Sybil B. Harrington Succulent Gallery*; the *White Tower and Erbium Fiori* on Stardust Foundation Plaza; and a *Summer Sun* nestled among the historic cactus in front of Webster Center. The most talked-about installation has been the 26 neon panels placed high on the Garden Butte.

The Garden is fortunate to have generous support from community sponsors to make this exhibit possible. *Chihuly in the Garden* exhibition is presented by JPMorgan Chase.

Evening viewing hours, *Chihuly at Night*, are sponsored by APS, and additional support for the exhibit was provided by Act One Foundation.

Presented by

CHASE J.P.Morgan

Chihuly at Night



Supported by
Act One Foundation

New This Year

Chihuly After Dark

8 p.m. - midnight | March 1, 8, 15, 22 and 29 / April 5, 12 and 19

This spring we are offering special Saturday late night time periods with a live DJ and a cash bar. Reservations and tickets are available through ticketing.

Chihuly Store

Webster Auditorium / 8 a.m. - 8 p.m. / daily
Shop for Studio Edition glass, limited edition prints, posters, apparel and other branded merchandise related to the Chihuly Exhibition.

Annex Store

Near seasonal butterfly exhibit
10 a.m. - 6 p.m. / daily
Shop for Chihuly Exhibition related merchandise.

Chihuly Video

Whiteman Conference Room
8 a.m. - 8 p.m. / daily
Watch the 30-minute video of the processes used by Dale Chihuly to create his magnificent works of art.

Audio Tours

Members: \$2 / General Public: \$3.50
The *Chihuly in the Garden* Acoustiguide Audio Tour introduces a number of installations and artworks throughout the Garden and is available through May 18, 2014.

Photography:

Chihuly in the Garden Exclusive

Capture the magnificent and unique beauty of the *Chihuly in the Garden* exhibition. Photograph during morning twilight or evening hours for completely different effects. Although this is not a classroom instruction program, a photography instructor will be on-site to answer questions and provide tips.

Tuesdays / January 28, February 4, 11, 18, 25 / 6 - 8 a.m.
OR

Wednesdays / January 29, February 5, 12, 19, 2 / 8 - 10 p.m.

Members: \$25 / General Public: \$31

Price per session. Limited availability. Reserve your spot at dbg.org or call 480.481.8188.

BUILDING UP *the* PILLAR of EDUCATION

by Kathleen Socolofsky, Assistant Vice Chancellor; Director, UC Davis Arboretum & Public Garden, and Diane Cary, Senior Writer, UC Davis Arboretum & Public Garden

As part of the Desert Botanical Garden's 75th anniversary celebration year, we are looking back at our history and how each pillar of our mission—education, conservation, research, and exhibition—has been fulfilled. I am pleased to have been asked to write about my experiences leading the education and interpretation programs of the Garden in the 1980s and 1990s, and the strategies we developed that continue to guide education at the Garden today.

As director of education in 1985, the collections were mature with amazing specimens that attracted visitors from around the world. At that time, however, the education pillar was not as well developed. It was not evident to many visitors, or to the residents of Phoenix, that this was an exceptional place for learning about the desert and desert plants.

Logically, if the Garden were going to really make an impact in protecting the desert environment and its plants, it needed to improve its ability to reach, educate, and inspire all visitors, especially those from the local area.

Education + Exhibition = a new Approach

When I joined the Garden's staff, plans were already in place to expand the role of exhibition in the Garden with a new *Plants and People of the Sonoran Desert* exhibit, which had just been funded by the National Endowment for the Humanities. Ruth Greenhouse, Garden exhibits coordinator and an expert in ethnobotany and nutrition, was the principal investigator and worked closely with Nancy Swanson, a trustee, and Robert Bruenig, the director, to develop the concept and implement the project.

The focus of the exhibit was on the ethnobotany of the Sonoran Desert. When I became a part of the team, we began expanding the role of education as it intersected with the exhibition goals. We looked for ways to link understanding, learning, and emotional connection to the exhibit experience so that it would encourage and promote a desire to steward the desert's resources. This was a departure from the standard model at most botanical gardens: formal indoor classes would usually be offered in accompaniment to the exhibit. Here, we started with

Left: Students examining desert plants up-close on Garden Trails.



Left: Ruth Greenhouse working on the *Plants and People of the Sonoran Desert Trail*, 1988. Right: Saguaro Harvesting Ramada provides shade when gathering saguaro fruits.

the assumption that the education program would permeate every aspect of the outdoor exhibit, so that every visitor would take part in the learning experience.

The *Plants and People of the Sonoran Desert* (PPSD) exhibit became a pilot project—the first time the Garden fully blended the exhibition and education pillars of its mission. This new approach inserted experiential education directly into the visitor experience of the exhibit. In addition to interpretive signs that conveyed educational content, it included interactive displays like the Cholla Bud Roasting Pit, and a demonstration area for learning about how the Tohono O’odham people collect and prepare cholla buds. At participatory activity stations along the trail, visitors could make a yucca brush, grind mesquite beans into flour, and make a rope from agave fiber.

The PPSD trail received national acclaim for its success. Director Robert Bruenig even testified before Congress about the value of NEH funding and what it had done to increase people’s understanding and appreciation of the desert, its plants, and people. He went to Washington, D.C., armed with mesquite cookies to serve to members of Congress!

Critical Thinking leads to Four Strategies

There are so many things that could be discussed in a retrospective issue on 75 years of education at the Desert Botanical Garden. I have chosen to focus on four strategies that propelled the development of the Garden as a premier educational institution, cemented its role as an outdoor classroom, and led to increased attendance, more financial support, and a greater community commitment to protecting the desert.



Visitor grinding mesquite beans into flour at an activity station on the *Plants and People of the Sonoran Desert Trail*.



A Garden instructor shows students the art of hand grinding mole.

Through our work on the PPSD project, we began to see the true potential of transforming the entire Desert Botanical Garden into an innovative, experiential “outdoor classroom” with the potential to increase understanding and appreciation of the desert in a way that traditional education could not. As we began, we asked ourselves a series of pointed questions:

- Why limit the Garden’s educational efforts to preregistered programs inside buildings when true learning could be drawn from direct experiences with the riches of the desert’s plants, wildlife, and environment?
- Why focus on providing education programs for just a small subset of people when there is an opportunity to educate all our visitors and entice them into additional learning as an extension of their visit?
- Why take school groups out of their classrooms just to put them into another classroom when they could instead experience the desert itself?
- How can we expect people to “protect the desert that is fast being destroyed” if they never learn to appreciate it through direct experience?

After all, we thought, nothing is more exciting than the unpredictable and immersive nature of the real experience of plants, wildlife, and weather—ever-changing and in their full glory. Stimulating experiences like smelling creosote bush in full fragrance after it rains, seeing cacti in their wide spectrum of colorful blooms, or watching a white-winged dove eating a saguaro fruit can much more quickly build the emotional connection that leads to better stewardship of the desert environment. . . and that was what we wanted to achieve.



Desert Landscape School students put their training into practice.



A young visitor studying a trail map before exploring the *Plants and People of the Sonoran Desert Trail*.

First Strategy: Master plan the entire trail system as an outdoor classroom

One of our first steps toward turning the Desert Botanical Garden into an outdoor classroom was to create a hierarchy of trails with one main trail and three secondary trails, each with educational themes and teaching messages that worked independently, but still built on each other. All trails were designed as loops, entered and exited at the same point to reduce confusion and keep visitors from getting lost, and all secondary trails were to be accessed from the main trail. You may recognize our work in the trails you know today:

- **Desert Discovery Trail** (the main trail) provides an introduction to desert plants and their adaptations to the desert environment.
- **Plants and People of the Sonoran Desert Trail** illustrates the importance of plants to people of the Sonoran Desert.
- **Sonoran Desert Nature Trail** highlights the ecology of the Sonoran Desert—the interconnections between plants, animals, geology, etc.
- **Center for Desert Living Trail** (including the Desert House) showcases research on sustainable desert living and demonstrates methods for conserving water, energy, and other resources.

These trail themes started to bridge all of the pillars of the Garden's mission. They included educational exhibits focused on the immediate surroundings, but they also featured ways to inform visitors about the research and conservation activities of the Garden.

When planning the trail system and exhibits, we worked with experts in the field of visitor studies (Dr. Stephen Bitgood and Dr. Chandler Screven) to develop strategies that would work in our informal setting and that would help us design the most interesting and motivating educational signage and interactive exhibits possible. The team exhibit development process we created is a key result of our National Science Foundation (NSF) grant and has become a model for public gardens. The process uses teams of staff and volunteers from different departments who brainstorm compelling ways to present specific educational messages, and then test exhibit mock-ups with visitors through a process of formative evaluation, refining them until they attract and hold visitor interest and convey their messages clearly.



Seedlings Preschool Program children experience the outdoors through hands-on activities.

Second Strategy: Infuse experiential learning into every aspect of the visitor experience

Experiential learning through active, hands-on discovery is more motivating than passive consumption of information, is more apt to spark interest, and is more likely to lead to long-term understanding and commitment to take action.

Choice, we learned, is central to informal education: visitors choose whether and how to participate, and educational opportunities must be designed to motivate them in an open, free-wheeling environment. Providing intrinsic rewards is a key factor—visitors are motivated by curiosity, problem-solving, exploration, and learning something relevant to their own lives. When their attention is caught by a question on a display and they can then see the answer by lifting a flap, they have an immediate reward and the system has accomplished its purpose. We developed these ways to move theories into reality:

- **Investigation Stations** (trailside gathering areas with benches and display surfaces) and mobile Discovery Carts to provide hands-on sensory experiences and opportunities to interact with docents and other visitors.
- **Interactive exhibits** to inspire visitors to look closely at special features of the plants, listen to birdsong, smell wet creosote bush (the scent of the desert when it rains), touch and compare leaves, and test their knowledge of desert ecology. We even provided a photo opportunity with a saguaro cactus for a ready-made Garden memory.

75
YEARS
and growing

DID YOU KNOW

The docent program began in 1977 with 27 people. Today we have a total of 927 active volunteers, of which 155 are docents.



Indoor lessons can be moved outdoors to broaden students' experiences.



Sonoran Desert Adventure Program students learn about composting and how it benefits plants.

It is thrilling to witness the team culture that is still in action at the Desert Botanical Garden today. This commitment to teamwork clearly propels the education pillar of the Garden's mission.

- **Trail exploration guidebooks** to supplement the information provided in the exhibits or by docents provide a place for visitors to record their own observations, and serve as a souvenir and resource for use at home. The Desert Detective exploration guide was designed as an interactive game; the guide to the *Desert Discovery Trail* won an award for Best Interpretive Guide Book from the National Interpreter's Association.
- **Immersion experiences** to invite visitors to mimic an important desert adaptation by going nocturnal. When the weather is brutally hot in the summer, Flashlight Tours celebrate the evening hours when all kinds of creatures emerge from their dens, allowing visitors to experience summer nights by using all their senses.

Third Strategy: Continue the process through extended learning opportunities

In the mid-1980s, the population of the Phoenix area began growing at an astounding rate, and many recent transplants knew very little about their new habitat. We quickly discovered that there was a huge demand for extended learning opportunities for community members, teachers, and school children.

- **Continuing Education Program:** In response to a growing demand for education, we developed a robust calendar of hands-on workshops and tours that spanned themes from horticulture and landscape design to the arts and ethnobotany.
- **Sonoran Desert Adventure Program:** We heard from teachers who brought their classes to the Garden that they themselves were unfamiliar with the desert environment and had trouble finding teaching materials relevant to the desert. With funding from the NSF grant, we developed the multi-faceted Sonoran Desert Adventure Program, which provided the needed information to both teachers and students.
- **Innovative Outreach Programs:** With additional support from donors, we worked with the Great Arizona Puppet Theater to develop three puppet shows featuring the plants and animals of the Sonoran Desert: *Hotel Saguaro*, *Seasons of the Desert*, and *Desert Night and Day*. Professional puppeteers visited classrooms to extend the Garden experience throughout the 1990s.

It is exciting to see how these programs have expanded over the years. The Garden now offers school tours for grades K-8, a digital learning

curriculum for teachers and students, classroom outreach, summer camp, and a range of youth and family programs.

Fourth Strategy: Build an interdisciplinary team culture to support education and learning

We were determined that the transformation of the Garden into an outdoor classroom would not be a one-time, static event but rather a continuous process of exploration and creation. We looked for ways to cement the educational focus and team approach, which had worked so well for us, into the Garden's culture. It is evident that this worked when you look at how staff and volunteers collaborate to promote education as a centerpiece of the mission. This team approach makes the long-term sustainability of educational programs more possible.

- Under the leadership of Pat Smith, volunteer manager, and Nancy Cutler, interpretive manager, the volunteer and docent programs grew significantly. Teams of volunteers and docents became a central feature of the educational experience for visitors. Working in teams helped volunteers form tight-knit social groups that reinforced their commitment to the Garden and their work.
- The team exhibit development process that we created fostered an interdisciplinary approach across departments and is alive and well today. Research and horticulture staff help to design educational exhibits; education staff help researchers and horticulturists share their work with visitors.
- We expanded our educational partnerships with other learning organizations, including ASU, local community colleges, the cities of Phoenix and Scottsdale, and local school districts. For example, we helped develop field exercises for biology students at ASU, so that they could use the Garden as an outdoor classroom and laboratory.

It is thrilling to witness the team culture that is still in action at the Desert Botanical Garden today. This commitment to teamwork clearly propels the education pillar of the Garden's mission.

Innovative Redesign brings Recognition

As I write this, more than 20 years since we began planning the transformation of the Garden into an outdoor classroom, I am pleased to see that the strategies we developed are still in place and expanding. As the number of visitors and participants continues to grow, the Garden's learning experience has greater and greater impact.

There has been considerable acclaim for the Garden and the role of its education and interpretation programs as a model for other institutions. The Comprehensive Desert Exhibit project garnered the Crescordia Award from the Valley Forward Association. Representatives from public gardens around the world have visited to learn about our educational programs, and Garden staff members have been invited to



Flashlight Tours share the desert at night by engaging all the senses.



Adult education propagation workshop.



Students learn to identify desert plants.

**“ONE OF MY CLOSEST
ENCOUNTERS with
Mother Nature /EARTH.”**

**“We saw cactus wrens.
They were *amazing*.”**



Reading a book outdoors can provide a deeper connection with the story and nature.

make presentations at professional museum and botanical garden conferences from coast to coast. Dr. Stephen Bitgood, an internationally-recognized expert on visitor behavior in museums, wrote that “[we] have not observed such enthusiasm from visitors for learning informal science at any other exhibit we have visited.”

Embedding education into the visitor experience has led to a fuller integration of the mission pillars, with education as a catalyst for other successes. New exhibits and programs have attracted more visitors, which has bolstered the financial health of the institution, allowing the expansion of educational offerings at the Garden.

We find the strongest evidence of the achievements of the educational programs, though, in quotes from our visitors: “One of my closest encounters with Mother Nature/Earth.” “We learned so much today.” “Best three hours one can spend in the desert.” And from children who visited with their classes: “I learned so much about plants...I sit on my roof every day and look and see if there are any new plants starting to grow in the neighborhood.” “We saw cactus wrens. They were amazing. Those mesquite beans were so cool, too. Being at the desert here was better than any other visit to any other place.” “It was really fun and I want to go again, even with my family.”

We can be proud to have been a part of creating a vibrant, compelling educational resource that invites visitors to develop a deeper understanding of their desert habitat and become an active part of its preservation.

“Best **THREE HOURS**
one can spend
in the desert.”



A school group explores the intersection between nature and art while viewing a temporary Garden exhibition.

“**IT WAS REALLY FUN** and I
want to go again,
even with my family.”

“**BEING AT THE
DESERT HERE** was
**BETTER THAN any
other visit to
any OTHER PLACE.**”



(Re)Introducing Kathleen Socolofsky

Kathleen Socolofsky has served as the director of the University of California at Davis Arboretum since 1998 and as an assistant vice chancellor since 2008. Recognized nationally as a leader in informal education and museum management, Socolofsky is the co-developer and leader of the UC Davis Arboretum GATEways (Gardens, Arts, and The Environment) initiative, which envisions the Arboretum as a physical and programmatic gateway to the campus.

In 2011, Socolofsky assumed responsibility for managing the UC Davis Grounds Division and Natural Reserve and is currently upsizeing the entire campus landscape of over 6,000 acres into a public garden.

Prior to joining UC Davis, Socolofsky served as the director of education at the Desert Botanical Garden for 13 years (1985-1998) where she was principal investigator for the National Science Foundation grant that transformed the Garden and its collections into an exciting interactive science center.

Socolofsky would like to say a special thank you to all of the staff and volunteers who have helped to build the Garden's dynamic education program over the years and to her sister, Mary Sue Ingraham, who served as the pro bono grant writer for the NSF Informal Science Education grant. Without their work, the Desert Botanical Garden might be a very different place, indeed.

garden news



An Artistic Tribute to Hazel Hare

A stunning wood-turned vase made from black walnut, standing 16.5 inches in height and 8.5 inches in diameter, is now on display in the Schilling Library.

The vase, created by the artist Philip Moulthrop, has been donated to the Garden in honor of Trustee Hazel Hare and in recognition of her generous support and service to the Desert Botanical Garden and the community.

Philip Moulthrop learned the art of woodturning from his father Ed Moulthrop, who is known as the father of modern woodturning. In his innovative process, "he glues and epoxies thinner branches from a tree on a turned bowl, then returns the bowl to the lathe and again turns the bowl, leaving only the specter of the original bowl whose branches float in a sea of epoxy." Woodturning has been a Moulthrop family legacy for three generations. Philip's work is on exhibit at some of the country's most prestigious museums, including the American Craft Museum, New York; Carnegie Museum of Art; Los Angeles County Museum of Art; and the Smithsonian Institution, Renwick Gallery of the National Museum of American Art.

We invite you to stop by the Schilling Library to view this beautiful addition to the Garden's art collection.

Happy Dogs Enjoy a Day Out

Last November 2012 the Desert Botanical Garden opened its gates for the first Dogs' Day in the Garden to tremendous canine approbation.

Human guests enjoyed special presentations ranging from making dog treats to keeping their companions safe in the desert environment. Garden trails were open for exploring and there were family photo opportunities, pet-friendly landscaping tips, and craft activities for both children and dogs.

To make the day even more special, we partnered with the Arizona Humane Society. With each dog being charged a dollar for admission to the event, the Garden was able to raise \$706 for this amazing valley organization!

"I just wanted to send my deepest thanks for hosting this very special day!! My dog and I thoroughly enjoyed our outing and we wanted to let you know how very much it meant to both of us to enjoy the day together. We sincerely hope that this will become a regular event as it provided us an opportunity to be with other dogs and their people and for the first time, my beloved dog was able to see the beauty of the Garden, plus we were able to enjoy a wonderful lunch. Thanks to all who helped make this event possible!!"

- Carol Coleman and Quigley

**Mark your calendars for Dogs' Day in the Garden
Saturday / January 25 / 8 a.m. – 12 p.m.**



Garden Contributes Talent and Treasures

The Desert Botanical Garden's Schilling Library and artistically talented members of the Garden's research staff were pleased to contribute to a recent exhibition of art, which was sponsored by the Sonoran Desert Florilegium Project.

The exhibit, *Botanical Art of the Sonoran Desert: Past & Present*, featured original work by juried artists, other notable artists, as well as historical works of botanical art.

On loan from the Schilling Library's Lyman Benson Collection was a selection of richly colored opuntias by L.C.C. Krieger, and from the Library archives, *Ficus Indica* Estetten (*Opuntia ficus indica*) from Basilius Besler's *Hortus Eystettensis*, published in 1613. Contributions to the exhibit by Garden staff included drawings of native Sonoran Desert plants by Curator of Living Collections Raul Puente (*Passiflora mexicana* and *Lepidium didymum*) and Curator of the Herbarium Wendy Hodgson (*Prosopis velutina*, *Capsicum annum* var. *glabriusculum*, *Lycium exertum*, and *Nolina microcarpa*).

The Sonoran Desert Florilegium Project encourages artists, educators, and scientists in their efforts to create and display botanical images. This provides the general public the opportunity to appreciate the aesthetic values and scientific need for the florilegium program as an aid to *conserving and protecting Sonoran Desert flora*.

The exhibit was held at Arizona Sonora Desert Museum's Ironwood Gallery, August 24 to October 27, 2013.



The Garden's Valley Metro Bus Stop Makes Easy Connections to Anywhere in the Valley

In July, the #56 bus route was extended from the Phoenix Zoo and now stops in the Garden's parking lot, connecting us to the light rail station at Priest and Washington.

Valley Metro offers a stress free alternative to driving and parking when you come to enjoy *Chihuly in the Garden*.

The Garden bus stop is located in the parking lot at the north end of the walkway to the Schilling Entry Arbor. The bus arrives every 30 minutes, Monday through Friday from 5:50 a.m. to 7:41 p.m. The schedule for weekend busses is different so plan ahead. You can purchase fare passes at Valley Metro Rail Stations, Circle K, Fry's and other locations valley-wide. For more information visit valleymetro.org.

Correction: On page 17 of the March 2013 issue of *The Sonoran Quarterly*, photo #6 is incorrect. The surviving boojum accessioned in 1939 is to the north across the path in bed 16.

Photo Credits

Page 2 Ken Schutz - Jim Poulin
Page 2 Ottosen Entry Garden - Adam Rodriguez
Page 3 Desert Botanical Garden historical photos courtesy of the Schilling Library Archives
Page 9 Wendy Hodgson and her beloved Bronco - Adam Rodriguez
Page 10 DBG Community Garden photos - Kenny Zelov
Page 11 Gertrude's restaurant - Susan Lynn Cope
Page 12 75th Anniversary Highlights - Jesse Tallman
Page 13 Chihuly Gala photos - Darrylee Cohen - Haute Photography

Page 16 Students examining desert plants - Desert Botanical Garden
Page 17 Ruth Greenhouse, Schilling Library Archives, Saguaro Harvesting Ramada - Adam Rodriguez, Grinding mesquite beans into flour - Desert Botanical Garden
Page 18 Instructor shows students the art of hand grinding mole - Desert Botanical Garden. Students put training into practice - Rebecca Senior. A young visitor studying a trail map - Desert Botanical Garden
Page 19 Children experience outdoors through hands-on activities - Mary Verosky

Page 20 Left: Students experiencing outdoor lessons - Mary Verosky. Right: Students learn about composting - Linda Harvey
Page 21 Summer Flashlight Tour activities - Adam Rodriguez
Page 22 Top left: Propagation workshop - Eric Garton. Bottom left: Students learn to identify desert plants - Desert Botanical Garden. Right: Reading outdoors connections the story and nature - Mary Verosky
Page 23 School group explores art and nature - Jesse Tallman, Kathieen Socolofsky - Ara Arbazadeh for V.I.P. Studios Photography

Page 24 Dogs' Day in the Garden - Adam Rodriguez
Page 25 *Opuntia ficus indica* from Basilius Besler's *Hortus Eystettensis*, 1613 - Schilling Library Archives, Raul Puente and Wendy Hodgson outside the Ironwood Gallery - Beth Brand. Bus arriving at the Garden - Kelsey Roderique
Back cover: *Las Noches de las Luminarias* - Adam Rodriguez, *Chihuly in the Garden* - Dale Chihuly, Polyvitro Chandelier, detail, 2005 - Terry Rishel

in appreciation

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Honor and memorial contributions are used to provide for the Desert Botanical Garden's horticulture, education and research programs. Gifts may also be recognized with benches & plaques. These contributions have been received from June 16, 2013 through September 15, 2013:

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In honor of Genie Mancuso
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The Desert Botanical Garden Mission

The Garden's commitment to the community is to advance excellence in education, research, exhibition, and conservation of desert plants of the world with emphasis on the Southwestern United States. We will ensure that the Garden is always a compelling attraction that brings to life the many wonders of the desert.



FREE WI-FI is available in five locations within the Desert Botanical Garden: the area in front of Admissions, Ottosen Entry Garden, Boppert Courtyard, the Center for Desert Living Trail, and Ullman Terrace.

WiFi Zone



City of Phoenix

PHOENIX, ARIZONA

Partial funding provided by the Phoenix Office of Arts and Culture through appropriations from the Phoenix City Council.



Join us this holiday season as we bring *Las Noches de las Luminarias* and *Chihuly in the Garden* together for 31 fabulous nights in celebration of the Desert Botanical Garden's 75th anniversary.

Each night of *Luminaria*, the Garden will come to life with the soft glow of more than 8,000 hand lit luminaria bags, thousands of white twinkle lights and the bright and vibrant colors of Dale Chihuly's works of art.

Visit dbg.org/luminaria for additional event information.

Hours 5:30 - 9:30 p.m.

Dates

November 29 and 30

December 1 - 23, 26 - 31

Ticket Prices

Members: Adults \$25

Children \$10 (3-12)

Children under three admitted free.

General Public: Adults \$30

Children \$12.50 (3-12)

Children under three admitted free.

To Purchase Tickets

- Order online at dbg.org/luminaria
- Call 480 481.8188 (8 a.m. - 5 p.m. daily)
- Visit the Admissions Box Office (8 a.m. - 8 p.m. daily)

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CHIHULY | IN THE GARDEN

Chihuly in the Garden Exhibition

Now through May 18, 2014

Three time periods per day

8 a.m. - Noon / 12 - 4 p.m. / 4 - 8 p.m.

Garden Members

Free member reservations.

Visit dbg.org/chihuly or call the

Membership Helpline at 480 941.3517.

Reservations highly recommended.

General Public

Adult: \$22, Senior: \$20

Student: \$12, Child: \$10

Children under three admitted free

Visit dbg.org/chihuly or contact the Garden Call Center at 480 481.8188 to purchase a ticket.



Dale Chihuly, Multicolored Polyvitra Chandelier, detail 2005, 34"2" x 8"2"

Advance reservations are highly recommended to help ensure availability of your desired date, time and parking spot. Limited walk-up tickets may be available. If a time period is sold out and you do not have a reservation or ticket, you may not be able to enter the Garden.

Presented by **CHASE** **J.P. Morgan**

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